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Original Research Article

EVALUATION OF NON-PHARMACOLOGICAL PAIN MANAGEMENT PRACTICES AND ASSOCIATED BARRIERS

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ABSTRACT

Background: *Chronic pain constitutes a significant global public health burden and necessitates a comprehensive multimodal management approach that extends beyond pharmacological interventions. International clinical guidelines strongly advocate incorporating non-pharmacological pain management strategies as integral components of holistic pain care. Despite robust evidence supporting their effectiveness, these approaches remain inadequately implemented in routine nursing practice, particularly in resource-constrained healthcare systems such as Pakistan.* ***Objective:*** *To assess the current practices of non-pharmacological pain management among registered nurses and to identify professional and systemic barriers influencing their implementation in a tertiary care hospital.* ***Study Design:*** *Descriptive cross-sectional study.* ***Settings:*** *The study was conducted at a tertiary care hospital in Pakistan.* ***Duration of Study:*** *January 2025 to July 2025.* ***Methods:*** *A total of 90 registered nurses with a minimum of six months of clinical experience were enrolled using non-probability convenience sampling. Data were collected using a structured, validated, self-administered questionnaire that included demographic characteristics, frequency of non-pharmacological pain management practices, and perceived barriers to implementation. Practice levels were categorized as good, moderate, or poor based on predefined scoring criteria. Data analysis was performed using SPSS version 25. Descriptive statistics were used to summarize variables, while chi-square tests and multivariable logistic regression analysis were applied to identify factors associated with good practice. Statistical significance was set at $p < 0.05$.* ***Results:*** *The mean age of participants was 36.8 ± 9.7 years, with a median clinical experience of seven years. Only 34.4% of nurses reported receiving formal pain management training within the preceding two years. The mean overall practice score was 42.6 ± 11.8, with 30.0% of participants demonstrating good practice, 53.3% moderate practice, and 16.7% poor practice. Frequently used interventions included comfort measures, patient reassurance, and therapeutic positioning, whereas cognitive and complementary techniques, such as guided imagery and music therapy, were infrequently employed. Major reported barriers were high patient-to-nurse ratios (80.0%), time constraints (76.7%), lack of structured training (64.4%), and absence of unit-based clinical protocols (60.0%). Multivariable logistic regression revealed that recent pain management training (adjusted odds ratio 3.12, 95% confidence interval 1.24–7.86) and the availability of unit-specific protocols (adjusted odds ratio 2.74, 95% confidence interval 1.12–6.70) were independent predictors of good practice.* ***Conclusion:*** *Non-pharmacological pain management practices among nurses were inconsistently implemented and were significantly influenced by institutional constraints and training deficiencies. The findings underscore the critical need for structured educational programs and standardized clinical protocols to enhance evidence-based pain management. Addressing systemic barriers is essential for optimizing nursing contributions to comprehensive pain care in tertiary healthcare settings.*

Keywords: Chronic pain; Non-pharmacological pain management; Nursing practice; Barriers

INTRODUCTION

Chronic pain is a complex, multifactorial health condition that affects millions of individuals worldwide and imposes a substantial burden on healthcare systems and national economies. It is widely recognized as a leading cause of disability, negatively influencing physical functioning, mental health, and overall quality of life. The World Health Organization highlights chronic pain as a major public health concern, noting its association with reduced productivity, increased healthcare utilization, and long-term psychological distress (1). Beyond its clinical implications, chronic pain also contributes to social isolation and financial hardship, particularly in low- and middle-income countries.

In recent years, non-pharmacological pain management strategies have gained increasing attention as effective and safer alternatives to conventional pharmacological treatments. These approaches include physical therapies, psychological interventions, lifestyle modification, and complementary and integrative therapies. Their growing adoption is largely driven by rising concerns regarding opioid dependence, medication-related adverse effects, and the limited long-term efficacy of pharmacological agents in chronic pain management (2). Consequently, international guidelines now emphasize multimodal and patient-centered approaches that prioritize non-pharmacological interventions as first-line or adjunctive treatments.

A growing body of evidence supports the effectiveness of non-pharmacological interventions in managing various chronic pain conditions. Interventions such as cognitive behavioral therapy, structured exercise programs, and multidisciplinary rehabilitation have demonstrated significant improvements in pain intensity, functional capacity, and psychosocial outcomes (3,4). Randomized controlled trials have shown that integrated interventions combining physical activity with psychological education can lead to marked reductions in pain scores and improvements in daily functioning, with some studies reporting improvement rates of up to 80 percent compared with usual care (5). Additionally, advancements in digital health have expanded access to non-pharmacological pain management through telehealth services, mobile applications, and online self-management programs, enabling patients to receive continuous care at home (6,7). Despite strong evidence supporting their effectiveness, the widespread implementation of non-pharmacological pain management strategies remains limited. Multiple barriers have been identified, including inadequate patient

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awareness, preference for pharmacological treatments, limited training of healthcare professionals, and insufficient institutional infrastructure to support these interventions (8,9). Qualitative studies suggest that some healthcare providers perceive non-pharmacological approaches as less effective or time-intensive, leading to underutilization in routine clinical practice (10). Furthermore, socioeconomic constraints such as limited access to specialized services, financial barriers, and inadequate insurance coverage further restrict patient engagement, particularly in resource-constrained settings (11).

In Pakistan, the burden of chronic pain is compounded by systemic healthcare challenges, including high patient loads, limited rehabilitation services, and insufficient integration of multidisciplinary care. In this context, the adoption of culturally appropriate, cost-effective non-pharmacological pain management strategies holds considerable promise. Addressing barriers related to awareness, accessibility, and professional training is essential to promote sustainable pain management solutions tailored to local needs (12). An integrated care model that acknowledges the biological, psychological, and social dimensions of chronic pain is particularly relevant for improving outcomes in the Pakistani healthcare setting.

So, chronic pain continues to represent a significant public health challenge globally and locally. Strengthening the implementation of evidence-based non-pharmacological interventions and systematically addressing barriers to their adoption are critical for improving patient outcomes. Collaborative efforts involving healthcare providers, patients, and policymakers are necessary to shift pain management practices toward a comprehensive, holistic, and sustainable model of care, particularly in low-resource environments such as Pakistan (13,14).

The objective of the study is to examine the current practices and systemic barriers related to the adoption of non-pharmacological pain management approaches for chronic pain within the Pakistani healthcare system.

METHODOLOGY

This descriptive cross-sectional study was conducted at Nishtar Hospital in Pakistan from January to July 2025. The study targeted registered nurses directly involved in bedside care across medical, surgical, intensive care, high dependency, and emergency departments. A sample size of 90 was achieved using nonprobability convenience sampling, based on staff availability during the study period and on comparable sample sizes used in similar nursing practice evaluations.

Eligible participants included registered nurses with at least six months of clinical experience in direct patient care roles. Nurses assigned purely administrative duties, interns, student nurses, and those on extended leave during the data collection period were excluded. Ethical approval was obtained from the institutional ethics committee, and written informed consent was obtained from all participants prior to enrolment. Participation was voluntary, and confidentiality was ensured through the use of anonymous questionnaires without personal identifiers.

Data were collected using a structured questionnaire developed following an extensive literature review of non-pharmacological pain management practices and barriers. The tool included three sections: socio-demographic and professional characteristics, frequency of use of non-pharmacological pain management techniques, and perceived barriers to implementation. Practice items were scored on a five-point frequency scale (Never, Rarely, Sometimes, Often, Always), and barrier items were scored on a five-point agreement scale (Strongly disagree to agree Strongly). Content validity was established through expert review by senior nursing faculty and clinical supervisors, and the questionnaire was pilot-tested with a small group of nurses not included in the final analysis to ensure clarity, feasibility, and comprehension. Internal consistency reliability was assessed using Cronbach's alpha for the practice scale and barrier scale.

Data collection was conducted during duty hours without interrupting clinical care. Questionnaires were distributed in sealed envelopes and returned in designated collection boxes to minimize response bias and improve privacy. The data were entered into SPSS version 25, with double-checking for missing values and entry errors. Descriptive statistics were used to summarize continuous variables as mean and standard deviation or median and interquartile range as appropriate, while categorical variables were reported as frequencies and percentages. The overall practice score was calculated by summing item scores and converting them to a percentage of the maximum possible score; participants were then categorized into good, moderate, and poor practice groups using predefined cutoffs. Associations between practice level and participant factors, such as years of experience, duty area, training status, protocol availability, and perceived workload, were assessed using chi-square tests for categorical variables and independent-samples t-tests or Mann-Whitney U tests for continuous variables, depending on normality. Variables demonstrating a meaningful association on bivariate analysis were entered into a multivariable logistic regression model to identify independent predictors of good practice, with adjusted odds ratios and 95% confidence intervals reported. A p-value less than 0.05 was considered statistically significant.

RESULTS

A total of 90 registered nurses participated in the study period, July to December, at a tertiary care hospital. The mean age of participants was 36.8 ± 9.7 years (range 22-58). Females constituted 58 (64.4%) and males 32 (35.6%). The median clinical experience was 7 years (IQR 4 to 11). Only 31 (34.4%) nurses reported receiving any structured pain management training within the preceding two years, indicating a substantial training gap. International evidence-based practice recognizes that non-pharmacological strategies should be integrated with pharmacological care as part of multimodal pain management, particularly in routine clinical settings. (Table 1)

Table 1: Demographic and professional profile of participants (n = 90)

Variable	Category	Frequency (%)
Age (years)	Mean ± SD	36.8 ± 9.7
Gender	Male	32 (35.6)
	Female	58 (64.4)
Highest nursing qualification	Diploma	34 (37.8)
	BSN	49 (54.4)
	MSN or Post RN specialty	7 (7.8)
Clinical experience	< 5 years	27 (30.0)
	5 to 10 years	39 (43.3)
	> 10 years	24 (26.7)
Current unit	Medical wards	28 (31.1)
	Surgical wards	24 (26.7)
	ICU and HDU	22 (24.4)
	Emergency Department	16 (17.8)
Duty pattern	Rotating shifts	63 (70.0)
	Fixed day shift	27 (30.0)
Pain management training in the last 2 years	Yes	31 (34.4)
	No	59 (65.6)

Non-pharmacological practice was measured using an 18-item frequency scale (Never, Rarely, Sometimes, Often, Always; scored 0-4), yielding a total score of 0-72. The overall mean practice score was

42.6 ± 11.8. Based on standardized categorization (Good ≥ 70%, Moderate 40 to 69%, Poor < 40%), 27 (30.0%) nurses demonstrated good practice, 48 (53.3%) moderate practice, and 15 (16.7%) poor practice. This distribution indicates that most nurses used non-pharmacological approaches inconsistently rather than routinely. (Table 2)

Table 2: Overall level of non-pharmacological pain management practice (n = 90)

Practice level	Operational definition	Frequency (%)
Good	≥ 70% of maximum score	27 (30.0)
Moderate	40 to 69% of the maximum score	48 (53.3)
Poor	< 40% of maximum score	15 (16.7)

Comfort and positioning measures were the most commonly used methods, followed by reassurance, deep breathing, and thermal therapy. Cognitive methods, such as guided imagery, and distraction tools, such as music therapy, were used less frequently. This pattern is consistent with published evidence that nurses commonly prefer practical bedside techniques (e.g., repositioning, cold or heat) and use fewer structured psychological interventions unless training and protocols are in place. Thermal modalities remain widely used, although the evidence varies by condition and context: moderate evidence supports superficial heat for some musculoskeletal pain and limited evidence in other settings, underscoring the need for protocols and appropriate patient selection. Music-based interventions are supported in several perioperative contexts and have shown clinically meaningful reductions in pain scores and analgesic use, yet their implementation remains inconsistent in routine care (Table 3).

Most nurses reported system-level barriers rather than attitude-related barriers. High patient load, time constraints, and staff shortage were the dominant challenges. Lack of institutional protocols and limited training opportunities were also common. These barriers mirror findings from large studies, where workload, insufficient staffing, limited managerial support, and a lack of protocols consistently predict poor practice in non-pharmacological pain management (Table 4).

To quantify severity, barrier intensity was also assessed on a 5-point Likert scale (Strongly disagree to agree Strongly; 1 to 5). The mean overall barrier score was 3.74 ± 0.61, with the highest mean scores for workload and time pressure (Table 5).

Good practice was significantly more common among nurses with more than five years of experience, those working in ICU and HDU, and those who had received recent pain management training. Nurses who reported the presence of a unit protocol also demonstrated higher practice scores. Workload-related barriers were inversely associated with practice scores (Table 6).

On multivariable logistic regression, recent training and the availability of a unit protocol remained independent predictors of good practice after adjusting for experience and duty area (Table 7).

Collectively, these findings suggest that practice is strongly modifiable through institutional measures, particularly structured training and standardized protocols. This aligns with broader evidence indicating that nurse education and organizational support improve uptake of non-pharmacological interventions.

Table 3: Frequency of use of specific non-pharmacological pain management techniques (n = 90)

Technique	Always n (%)	Often n (%)	Sometimes n (%)	Rarely n (%)	Never n (%)
Proper positioning and comfort measures	38 (42.2)	28 (31.1)	18 (20.0)	4 (4.4)	2 (2.2)
Reassurance and therapeutic communication	34 (37.8)	29 (32.2)	18 (20.0)	6 (6.7)	3 (3.3)
Deep breathing and relaxation coaching	22 (24.4)	25 (27.8)	26 (28.9)	11 (12.2)	6 (6.7)
Cold or hot application	18 (20.0)	21 (23.3)	24 (26.7)	17 (18.9)	10 (11.1)
Massage or gentle rubbing where appropriate	10 (11.1)	18 (20.0)	28 (31.1)	20 (22.2)	14 (15.6)
Distraction techniques (conversation, tasks, visuals)	12 (13.3)	17 (18.9)	30 (33.3)	17 (18.9)	14 (15.6)
Guided imagery	4 (4.4)	9 (10.0)	16 (17.8)	26 (28.9)	35 (38.9)
Music therapy	3 (3.3)	7 (7.8)	14 (15.6)	24 (26.7)	42 (46.7)

Table 4: Reported barriers to non-pharmacological pain management (n = 90)

Barrier	Yes n (%)	No n (%)
High patient-to-nurse ratio	72 (80.0)	18 (20.0)
Time constraints during shifts	69 (76.7)	21 (23.3)
Lack of formal training or workshops	58 (64.4)	32 (35.6)
No unit-based pain management protocol	54 (60.0)	36 (40.0)
Inadequate administrative support	46 (51.1)	44 (48.9)
Limited supplies for comfort measures (ice packs, privacy aids)	44 (48.9)	46 (51.1)
Lack of interprofessional coordination	41 (45.6)	49 (54.4)
Poor patient cooperation or low health literacy	39 (43.3)	51 (56.7)

Table 5: Barrier intensity scores (Likert scale summary, n = 90)

Barrier domain	Mean ± SD
Workload and staffing pressure	4.21 ± 0.68
Time limitation during routine care	4.07 ± 0.71
Training and competency gap	3.82 ± 0.77
Lack of standardized protocol	3.79 ± 0.73
Resource and supply limitations	3.48 ± 0.80
Interprofessional coordination issues	3.33 ± 0.84

Table 6: Association of selected factors with good practice (n = 90)

Variable	Category	Good practice n (%)	Not good practice n (%)	p value
Experience	< 5 years (n = 27)	4 (14.8)	23 (85.2)	0.018
	≥ 5 years (n = 63)	23 (36.5)	40 (63.5)	

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Recent training	Yes (n = 31)	15 (48.4)	16 (51.6)	0.003
	No (n = 59)	12 (20.3)	47 (79.7)	
Unit protocol	Yes (n = 36)	16 (44.4)	20 (55.6)	0.006
	No (n = 54)	11 (20.4)	43 (79.6)	
Duty area	ICU and HDU (n = 22)	10 (45.5)	12 (54.5)	0.041
	Other units (n = 68)	17 (25.0)	51 (75.0)	

Table 7: Multivariable logistic regression for predictors of good practice (n = 90)

Predictor	AOR	95% CI	p value
Recent pain management training (Yes vs No)	3.12	1.24 to 7.86	0.016
Unit protocol available (Yes vs No)	2.74	1.12 to 6.70	0.028
Experience ≥ 5 years (Yes vs No)	2.06	0.63 to 6.69	0.231
ICU and HDU posting (Yes vs No)	1.88	0.61 to 5.80	0.271

DISCUSSION

The findings of the present study provide important insights into the current state of non-pharmacological pain management practices among registered nurses working in a tertiary care hospital. The demographic profile of participants, with a mean age of 36.8 years and a median clinical experience of seven years, reflects a relatively experienced nursing workforce. Despite this, fewer than one-third of nurses reported receiving structured pain management training in the past 2 years, indicating a substantial gap in continuing professional education. This is particularly concerning given international evidence supporting the integration of non-pharmacological strategies as an essential component of multimodal pain management (15,16).

The overall mean non-pharmacological practice score of 42.6 suggests that these interventions are applied inconsistently in routine clinical care. While approximately one-third of nurses demonstrated good practice, the majority fell within the moderate or poor practice categories. Similar trends have been reported in previous studies, in which nurses acknowledged the importance of non-pharmacological pain management but reported limited application due to institutional and workload-related constraints (16). The preference observed in this study for basic comfort measures and verbal reassurance aligns with the existing literature, which indicates that nurses are more likely to use easily implementable bedside techniques than structured cognitive or behavioral interventions (17,18). This pattern highlights a reliance on intuitive practices rather than evidence-based psychological strategies.

A key finding of this study is a statistically significant association between years of experience, recent training, and the presence of unit-based pain management protocols with higher practice scores. Nurses with more than five years of clinical experience and those who had received recent training were significantly more likely to demonstrate effective non-pharmacological pain management practices. These findings are consistent with prior research demonstrating that targeted educational interventions and standardized clinical guidelines enhance nurses' confidence and competency in pain management (17). The absence of formal protocols in the majority of clinical units further contributes to practice variability, reinforcing evidence from previous studies that structured institutional policies facilitate consistent and effective pain management (19).

System-level barriers emerged as a dominant challenge in implementing non-pharmacological pain management strategies. High patient-to-nurse ratios, time constraints, and limited administrative support were frequently reported, reflecting broader systemic issues in healthcare delivery. These findings are in line with international and regional studies that identify workload and staffing shortages as persistent obstacles to quality pain management (20,21). The high mean workload intensity score underscores the need for organizational and policy-level interventions to improve staffing adequacy and workload distribution, enabling nurses to implement comprehensive pain management approaches.

Notably, cognitive and complementary techniques such as guided imagery and music therapy were among the least utilized interventions. This underutilization may be attributed to limited training, lack of institutional encouragement, and perceived complexity of these methods. Previous studies have shown that organizational support and skill-based training significantly influence nurses' willingness to employ such techniques (22). Given robust evidence demonstrating the effectiveness of cognitive and sensory-based interventions in reducing pain intensity and improving patient satisfaction, their limited use represents a missed opportunity for enhancing patient outcomes (23).

Overall, the findings of this study have important implications for nursing education, clinical practice, and health policy in Pakistan. Strengthening continuing education programs, establishing standardized pain management protocols, and addressing systemic workload barriers are critical steps toward improving the integration of non-pharmacological pain management strategies. Enhancing nurses' capacity in this domain can improve patient outcomes, reduce reliance on pharmacological therapies, and foster a more holistic approach to pain management. These measures are particularly relevant in resource-constrained healthcare settings, where sustainable, low-cost interventions are essential to address the growing burden of chronic pain (24,25).

This study was conducted in a single tertiary care hospital, which may limit the generalizability of the findings to other healthcare settings. The use of a self-reported questionnaire may have introduced response bias. Additionally, the cross-sectional design precludes causal inferences, and the reliance on reported practices rather than direct observation may not fully reflect actual clinical behavior.

CONCLUSION

This study demonstrates that non-pharmacological pain management strategies are underutilized and inconsistently applied by nurses in tertiary care settings, despite strong international recommendations supporting their use. Institutional factors, particularly the lack of structured training and standardized protocols, play a decisive role in limiting effective implementation. Strengthening continuing nursing education, developing unit-specific pain management guidelines, and addressing workload-related constraints are critical steps toward improving holistic and sustainable pain management practices. Enhancing these modifiable system-level factors may substantially improve patient outcomes while reducing reliance on pharmacological interventions in resource-constrained healthcare environments.

DECLARATIONS

Data Availability Statement

All data generated or analysed during the study are included in the manuscript.

Ethics approval and consent to participate
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Consent for publication
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Not applicable

CONFLICT OF INTEREST

The authors declare no conflict of interest.

AUTHOR CONTRIBUTION

SHAZIA AHMED
Conceived the study, supervised data collection, and contributed to manuscript drafting
QAMAR UN NISA
Assisted in study design, data acquisition, and literature review
SHAZIA TAJ
Performed data collection, maintained records, and assisted in initial analysis.
YASMIN TAHIRA
Contributed to data interpretation, preparation of tables, and figures
AZKA MAZHAR
Assisted in proofreading, critical revision, and final approval of the manuscript

All authors read and approved the final version of the manuscript.

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