

Knowledge and Practices of Intensive Care Unit Nurses Regarding Pain Assessment and Pain Management Among Critically Ill Patients

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(Received, 24th July 2025, Accepted 19th September 2025, Published 30th September 2025)

Abstract: Practical pain assessment and management are critical components of intensive care, directly influencing recovery outcomes in critically ill patients. Despite the availability of validated tools, such as the Critical-Care Pain Observation Tool (CPOT) and Behavioral Pain Scale (BPS), evidence suggests inconsistent utilization by intensive care unit (ICU) nurses, especially in resource-constrained settings like Pakistan. This study aimed to evaluate ICU nurses' knowledge and practices in pain assessment and management for critically ill patients. **Methods:** A descriptive cross-sectional study was conducted among 245 ICU nurses across five public and private hospitals in Lahore and Multan, Pakistan. Participants were selected through non-probability convenience sampling. Data were collected using a structured, pre-tested questionnaire comprising demographic variables, knowledge-related items (7 domains), and practice-related items (15 domains). Knowledge and practice were scored and categorized as poor, average, or good. Descriptive statistics, including frequencies and percentages, were analyzed using SPSS version 25. **Results:** Of the 245 nurses, 75.1% were female, and the majority (50.2%) belonged to the 31–35 years age group. Educationally, 45.3% held a Generic BSN degree, while only 2% had an MSN. Nearly 58% had 2–5 years of ICU experience. The mean knowledge score was 4.46 ± 1.29 (range 1–7); only 24.1% demonstrated good knowledge, 52.7% had average knowledge, and 23.3% had poor knowledge. The mean practice score was 8.59 ± 2.10 (range 1–15); 18.8% demonstrated good practices, 65.3% had average practices, and 15.9% had poor practices. Significant gaps were identified in documentation (only 44.9% recorded pain monitoring) and in the use of standardized tools for non-communicative patients (54.7%). **Conclusion:** The findings reveal that while ICU nurses possess a moderate understanding of pain assessment and management, significant deficiencies persist in both knowledge and practice, particularly in documentation and the utilization of standardized tools. Targeted educational interventions, the integration of pain management modules into nursing curricula, and institutional policies mandating the consistent use of validated assessment tools are urgently needed to strengthen ICU nurses' competencies. Such measures could enhance patient outcomes and align clinical practice with international standards of critical care.

Keywords: Pain assessment, Pain management, Intensive care unit, Nurses, Knowledge, Practices

[How to Cite: Shabbir N, Ghani M, Kausar S, Khan MS, Mehdi MA. Knowledge and practices of intensive care unit nurses regarding pain assessment and pain management among critically ill patients. *Biol. Clin. Sci. Res. J.*, 2025; 6(9): 38-42. doi: <https://doi.org/10.54112/bcsrj.v6i9.1994>

Introduction

In the realm of critical care medicine, the assessment and management of practical pain have emerged as vital components of a holistic approach to patient care. The Intensive Care Unit (ICU) environment is associated with complex, multifaceted pain experiences due to the nature of critical conditions and invasive interventions required by patients. Research underscores that pain can significantly impact the recovery trajectory of critically ill patients, leading to increased morbidity, prolonged ICU stays, and diminished quality of life post-discharge (1, 2). This highlights the importance of ICU nurses possessing adequate knowledge and skills related to pain management, as they play a pivotal role in assessing and mitigating pain in this vulnerable population (3, 4). Despite this, studies indicate that ICU nurses often exhibit gaps in knowledge and inadequate pain management practices, which may stem from factors such as insufficient training, environmental constraints, and the complexities of caring for critically ill patients (5, 6).

Recent clinical practice guidelines emphasize the need to use validated pain assessment tools that address the unique challenges faced by nonverbal, critically ill patients (7, 8). Tools such as the Critical-Care Pain Observation Tool (CPOT) and the Behavioral Pain Scale (BPS) provide structured methodologies for assessing a patient's pain when direct reporting is not feasible (9). However, significant underutilization of these

assessment tools persists in clinical settings, revealing a concerning disconnect between available protocols and daily nursing practices (10). Ensuring consistent application of pain assessment frameworks can enhance pain identification, guide appropriate analgesic interventions, and potentially improve patient outcomes (1, 11, 12).

Moreover, recent literature analyzes various methodologies and educational strategies that can empower nurses to enhance their pain management competencies. Studies have demonstrated the efficacy of multimodal pain management approaches that integrate pharmacological interventions and complementary therapies, supporting the notion that pain management should be personalized to address the physiological and psychological dimensions of patients' pain (13, 14). Interestingly, cultural beliefs and the specific healthcare context can significantly influence how pain recognition and management are perceived and implemented, necessitating localized approaches that resonate with the population being served (15, 4).

In a Pakistani context, where resources may be limited and the healthcare system is under significant strain, improving pain management practices in ICUs becomes even more urgent. The Pakistani population faces challenges, including limited access to pain management education, cultural stigmas surrounding pain perception, and a rising incidence of chronic illnesses requiring critical care (5, 6). Nurses, who frequently serve as primary caregivers in ICU settings, must navigate these



complexities and often lack adequate training in effective pain assessment methodologies, complicating their ability to provide optimal care (6, 3). Addressing these gaps through targeted education programs and practice improvement initiatives within the Pakistani healthcare landscape can cultivate better pain management practices, enhancing patient outcomes in the ICU and beyond.

Methodology

The study employed a quantitative cross-sectional design to assess the knowledge and practices of intensive care unit (ICU) nurses regarding pain assessment and management among critically ill patients. This design was considered appropriate because it allowed data collection at a single point in time and facilitated the description of existing knowledge and practices within the target population. The research was conducted in multiple public hospitals of Lahore and Multan, Pakistan, including Jinnah Hospital Lahore, Lahore General Hospital, Services Institute of Medical Sciences Lahore, Nishtar Hospital Multan, and Multan Institute of Cardiology. The study duration was twelve months, commencing after approval of the research synopsis by the University of Health Sciences, Lahore.

The target population consisted of registered nurses working in the ICUs of the selected hospitals. Participants were eligible for inclusion if they were male or female registered nurses aged 20 to 40 years and had at least 1 year of continuous ICU experience. Head nurses were excluded from participation to ensure uniformity of responsibilities among respondents. A sample size of 245 nurses was calculated using the Kish-Leslie formula, based on an anticipated prevalence of 80%, a 95% confidence interval, and a 5% margin of error. A non-probability convenience sampling technique was adopted to maximize recruitment and participation within the available time frame and resources.

Data collection was performed using a structured, pretested questionnaire adopted and modified from previously validated tools. The instrument consisted of three sections. The first section collected demographic data, including gender, educational qualifications, years of experience, ICU specialty, duty shifts, hospital type, number of ICUs in the hospital, and ICU bed capacity. The second section assessed knowledge of pain assessment and management, including multiple-choice questions, case scenarios, and yes/no statements. Items focused on the importance of pain assessment, recognition of behavioral and physiological indicators, and awareness of non-pharmacological pain management measures. The third section addressed practices, comprising 15 items on the actual evaluation and management behaviors adopted by nurses in their ICU settings. Responses were dichotomized as correct (yes) or incorrect (no).

A scoring system was applied to quantify knowledge and practice levels. For knowledge, each correct response was scored as one point, with total scores ranging from 1 to 7. Knowledge was categorized as poor (<50%), average (50–75%), or good (>75%). For practice, correct responses were awarded one point each, with total scores ranging from 1 to 15. Practices were categorized as poor (<40%), average (40–70%), or good (>70%).

Data were collected after obtaining permission from the hospital administrations and informed consent from the participants. The researcher personally distributed and collected the questionnaires,

providing clarifications when necessary and ensuring a safe, confidential environment for responses. Confidentiality and anonymity were maintained throughout the study by omitting identifying information and ensuring secure storage of completed questionnaires.

All data were analyzed using IBM SPSS version 25. Descriptive statistics, including frequencies, percentages, and means with standard deviations, were generated to summarize demographic characteristics, knowledge scores, and practice scores.

Results

A total of 245 ICU nurses participated in the study. The majority were female (75.1%), while 24.9% were male (Table 1). Most respondents belonged to the 31–35 age group (50.2%), followed by the 21–25 age group (36.7%). Educationally, 45.3% held a Generic BSN, 38% were Post RN BSN, 14.7% Diploma holders, and only 2% had an MSN degree.

In terms of professional experience, 47.8% had more than 10 years of experience, while 31.8% reported 2–5 years of experience. Regarding ICU-specific expertise, the majority (58%) had 2–5 years of ICU experience, while 24.9% had <2 years.

Specialty distribution showed that most respondents worked in medical (35.1%) and neuroscience (25.3%) ICUs. The majority (32.2%) worked in rotating shifts, followed closely by night shifts (31.4%). Nearly half (44.9%) of participants were employed in tertiary care hospitals, 35.9% in private hospitals, 15.1% in THQs, and 4.1% in DHQs.

Most hospitals had two ICUs (49.8%), while 29% had only one. The majority of ICUs had 21–30 beds (63.7%). (Table 1).

Knowledge was assessed across seven domains (Table 2). Overall, the mean knowledge score was 4.46 ± 1.29 (range 1–7). Categorization showed that 23.3% of nurses had poor knowledge (<50%), 52.7% had average knowledge (51–75%), and only 24.1% demonstrated good knowledge (>75%).

Most participants recognized that pain can affect vital signs (74.7%) and that non-pharmacological measures are essential (77.6%). However, misconceptions were evident: 53.9% disagreed that non-pharmacological measures are effective for mild-to-moderate pain, and 37.1% did not consider facial expressions or restlessness as reliable indicators of pain. (Table 2).

The mean practice score was 8.59 ± 2.10 (range 1–15). Overall, 15.9% of nurses had poor practices (<40%), 65.3% had average practices (41–70%), and 18.8% demonstrated good practices (>71%).

Practice gaps were evident in monitoring and documentation. However, 72.2% reported that their facility had a process for screening pain, but only 44.9% documented pain monitoring in patient records. Similarly, while 67.3% reported using nonverbal cues, only 54.7% used standardized tools for non-communicative patients. (Table 3).

The majority of participants were young female nurses with BSN degrees and 2–10 years of ICU experience. Only one-fourth demonstrated good knowledge of pain assessment and management. Practices were largely average, with significant weaknesses in documentation and the use of standardized tools. Both expertise and practices require strengthening through structured training and institutional policies.

Table 1. Demographic Characteristics of ICU Nurses (N = 245)

Variable	Categories	Frequency (n)	Percentage (%)
Gender	Female	184	75.1
.03.	Male	61	24.9
Age	21–25 years	90	36.7
	26–30 years	19	7.8
	31–35 years	123	50.2
	36–40 years	13	5.3
Education	Diploma in Nursing	36	14.7
	Post RN BSN	93	38.0
	Generic BSN	111	45.3

Work Experience	MSN	5	2.0
	<2 years	50	20.4
	2–5 years	78	31.8
	>10 years	117	47.8
ICU Experience	<2 years	61	24.9
	2–5 years	142	58.0
	>10 years	42	17.1
Primary Specialty	Medical	86	35.1
	Neuroscience	62	25.3
	Surgical	47	19.2
	Cardiovascular	12	4.9
	Combined	12	4.9
	Others	26	10.6
Shift Rotation	Day only	58	23.7
	Evening only	31	12.7
	Night only	77	31.4
	Rotation	79	32.2
Hospital Type	DHQ	10	4.1
	THQ	37	15.1
	Tertiary Care	110	44.9
	Private	88	35.9
No. of ICUs	1	71	29.0
	2	122	49.8
	3	52	21.2
ICU Beds	11–20	89	36.3
	21–30	156	63.7

Table 2. Knowledge of ICU Nurses Regarding Pain Assessment and Management

Item	Yes n (%)	No n (%)
Pain assessment should be part of the nursing process	136 (55.5)	109 (45.5)
Use of a pain assessment tool for communicative patients	159 (64.9)	86 (35.1)
Pain can be assessed by facial expressions/movements	154 (62.9)	91 (37.1)
Pain affects vital signs	183 (74.7)	62 (25.3)
Knowledge of non-pharmacological measures is important	190 (77.6)	55 (22.4)
Non-pharmacological measures are effective only for mild/moderate pain	113 (46.1)	132 (53.9)
Unrelieved pain affects recovery	158 (64.5)	87 (35.5)

Table 3. Practices of ICU Nurses Regarding Pain Management

Item	Yes n (%)	No n (%)
The facility has a process to screen for pain	177 (72.2)	68 (27.8)
Policy/procedure for screening exists	157 (64.1)	88 (35.9)
Comprehensive assessment after pain identification	120 (49.0)	125 (51.0)
Nurses ask patients to rate pain using a scale	166 (67.8)	79 (32.2)
All pain assessment elements documented	147 (60.0)	98 (40.0)
Comprehensive assessment recorded in forms	142 (58.0)	103 (42.0)
Care plan developed for patients with pain	141 (57.6)	104 (42.4)
Scheduled medication provided for persistent pain	140 (57.1)	105 (42.9)
Non-pharmacological approaches used	132 (53.9)	113 (46.1)
Monitoring pain relief regularly	147 (60.0)	98 (40.0)
Use of an appropriate scale for non-communicative patients	133 (54.7)	112 (45.3)
Nurses use nonverbal cues	165 (67.3)	80 (32.7)
Documentation in the medical record	110 (44.9)	135 (55.1)
Policy for measuring patient satisfaction	109 (44.5)	136 (55.5)
Reassessment of patients with pain	120 (49.0)	125 (51.0)

Discussion

The results of our study on ICU nurses' knowledge and practices in pain assessment and pain management for critically ill patients provide significant insights into the current state of pain management in intensive care settings. A total of 245 ICU nurses participated, predominantly female (75.1%), with a significant representation from the 31–35-year age group (50.2%). The participants' educational backgrounds suggested a

strong foundation in nursing: 45.3% held a Generic BSN, while only 2% held an MSN, indicating a lack of advanced degrees. Familiarity with ICU work varied, with approximately 58% having 2–5 years of specific ICU experience, which correlates closely with their overall professional experience, as 47.8% had more than 10 years of nursing experience. When comparing the knowledge levels of nurses to existing literature, a study by Olimat et al. highlighted the positive impact of pain management educational programs, suggesting that structured training can

significantly enhance nurses' knowledge and attitudes towards pain management Olimat et al. (16). Our findings indicated a mean knowledge score of 4.46 ± 1.29 , with only 24.1% demonstrating good knowledge (>75%). This finding aligns with Alnajjar et al., who noted that ICU nurses often face various barriers—primarily time constraints and workload—that hinder their capacity for practical pain assessment (17).

Additionally, although most participants recognized the importance of non-pharmacological measures for pain management (77.6%), misconceptions about their efficacy for mild-to-moderate pain persisted: 53.9% disagreed with their effectiveness for this pain intensity. This inconsistency further supports findings by Berntzen et al., who identified that ICU nurses often struggle to distinguish between pain and other discomforts, complicating their assessment practices (18).

Regarding nursing practices, our results indicated a mean practice score of 8.59 ± 2.10 , with only 18.8% of nurses demonstrating good practices (i.e., a score greater than 71%). The noted lack of documentation in pain management—a critical aspect—was observed, with only 44.9% of patient records recording pain monitoring. This finding aligns with Batiha's assertion that inadequate documentation continues to be a significant barrier to effective pain management in many ICU settings, leading to under-treatment (19).

In terms of monitoring practices, substantial gaps were evident. Although 72.2% claimed their facility had a process for screening pain, only 54.7% used standardized tools for non-communicative patients. This disparity mirrors findings by Kahsay and Pitkäjärvi, who noted that emergency nurses in resource-limited settings cite a lack of standardized assessment tools as a barrier to effective pain management (20). The critical nature of pain assessment tools, such as the Critical-Care Pain Observation Tool (CPOT), is well supported by studies advocating for their implementation in ICU settings to better monitor and manage pain in patients who are unable to communicate verbally (21, 22).

Further examination of specific barriers reveals that factors such as time management and adequate staffing can critically influence pain management practices. Nurses reported significant obstacles, including insufficient staffing levels and inadequate time to perform comprehensive assessments, often resulting in reliance on non-verbal cues for evaluation, thereby complicating the accuracy of pain assessments, as explored by Tohol et al. (23).

The nurses' reported use of non-pharmacological approaches (53.9%) was less than ideal, with many studies advocating for their critical role in pain management. Research by Younis indicates that a considerable number of nurses do not effectively implement assessment tools for non-verbal patients, revealing an area that needs substantial improvement.

Moreover, the demographic characteristics of the nurses in our study indicate a young and predominantly female workforce, which aligns with broader trends in the nursing profession. However, it highlights the need for targeted training programs to address pain management competencies among newer graduates. Mion et al. assert that integrating educational programs detailing pain assessment protocols can significantly enhance nursing practice and patient outcomes (25).

The lack of compliance with pain management guidelines and protocols, highlighted by our results, reveals systemic issues that necessitate urgent attention. The importance of structured educational programs cannot be understated; significant improvements in knowledge and practices following such interventions have been demonstrated in prior studies (26, 27).

Thus, our findings indicate that while ICU nurses possess a fundamental understanding of pain assessment and management, significant gaps remain, particularly in documentation practices and the effective use of pain assessment tools. These gaps underscore the need for higher education initiatives, restructured institutional policies, and, potentially, the inclusion of dedicated pain management curricula in nursing programs to ensure comprehensive, culturally competent care for critically ill patients. In Pakistan, with its unique healthcare challenges, the need for localized educational strategies and support systems to equip nurses to

deliver optimal pain management in intensive care settings is even more emphasized.

Conclusion

This study underscores the critical gaps in ICU nurses' knowledge and practices regarding pain assessment and management in Pakistan. Despite moderate awareness, only a minority demonstrated good knowledge and practices, with notable deficiencies in documentation and the use of validated tools for non-verbal patients. These shortcomings reflect systemic barriers, including insufficient training, heavy workloads, and a lack of institutional policies, which collectively compromise the quality of pain management in intensive care. Addressing these gaps requires a multifaceted approach, including structured continuing education programs, integrating pain management protocols into hospital policies, and including specialized modules in nursing curricula. By equipping nurses with the necessary competencies and enforcing standardized practices, healthcare systems can ensure better patient outcomes, reduced ICU morbidity, and improved quality of life for critically ill patients.

Declarations

Data Availability statement

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

Ethics approval and consent to participate

Approved by the department concerned. (IRBEC-24)

Consent for publication

Approved

Funding

Not applicable

Conflict of interest

The authors declared no conflicts of interest.

Author Contribution

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Manuscript drafting, Study Design,

Review of Literature, Data entry, Data analysis, and drafting an article.

MG (Assistant Professor)

Conception of Study, Development of Research Methodology Design,

Study Design, manuscript review, and critical input.

SK (Prof of Nursing, HOD)

Data analysis and drafting an article.

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All authors reviewed the results and approved the final version of the manuscript. They are also accountable for the integrity of the study.

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