

# The Impact of Nursing Intervention on Pain Management among Children with Chronic Illnesses in the Pediatric Intensive Care Unit

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**Abstract: Background:** Pain control represents a fundamental component of care for children with chronic conditions admitted to the pediatric intensive care unit (PICU). Insufficient management of pain may adversely affect both the physical and psychological well-being of pediatric patients. Therefore, this study was conducted to assess the effectiveness of nursing interventions in improving pain management among children with chronic illnesses in the PICU. A randomized controlled trial was employed in this study and carried out in the pediatric intensive care unit of a specialized hospital. The study involved a selected group of pediatric patients diagnosed with chronic illnesses, who were randomly assigned to either an intervention group or a control group. Data collection was performed using validated pain assessment tools and a nursing intervention observation checklist. Pain intensity was evaluated before and after the application of structured nursing interventions, which included routine pain assessment, pharmacological and non-pharmacological pain relief measures, and family participation in care. The findings demonstrated a statistically significant reduction in pain scores among children in the intervention group compared with those receiving standard care. These results indicate that structured nursing interventions were effective in enhancing pain control and improving patient comfort in the pediatric intensive care unit. The study concluded that nursing interventions play a significant and positive role in pain management for children with chronic illnesses in the PICU and recommends the adoption of standardized pain management protocols and ongoing nursing education to optimize pediatric care outcomes. **Results:** The comparison of FLACC pain scores before and after the intervention demonstrated a statistically significant reduction in pain levels following the implementation of nursing interventions. These findings confirm the effectiveness of nursing interventions in improving pain management among children with chronic illnesses in the pediatric intensive care unit. **Conclusions:** Based on the findings of the study, it can be concluded that nursing interventions have a vital role in enhancing pain management for children with chronic illnesses in the pediatric intensive care unit (PICU). The application of structured nursing interventions led to a significant decrease in pain intensity and a noticeable improvement in patient comfort. In addition, consistent pain assessment combined with both pharmacological and non-pharmacological approaches improved the quality of care and positively influenced patient outcomes. These results emphasize the essential contribution of nurses to effective pain management in the PICU. **Recommendations:** Ongoing education and training programs should be provided for nurses to strengthen their skills in pediatric pain assessment and management.

## Introduction

Pain is defined as an unpleasant sensory and emotional experience related to actual or potential tissue damage and is shaped by physiological, psychological, and developmental factors in children (International Society for the Study of Pain, 2020). Children with chronic illnesses who are admitted to the pediatric intensive care unit (PICU) are particularly vulnerable to experiencing both acute procedural pain and ongoing pain associated with their underlying conditions and medical treatments. Pain among critically ill children is frequently under-recognized and inadequately managed due to limited communication abilities, such as mechanical ventilation, sedation, or developmental impairments, as well as the complexity and resource-intensive nature of pain assessment in the PICU. Inadequate pain recognition and assessment can hinder recovery, increase physiological stress responses, and contribute to adverse long-term consequences, including chronic pain sensitization and psychological distress (Smith et al., 2023).

Nurses have a central role in the assessment and management of pain within the pediatric intensive care unit (PICU). They are responsible for continuous patient monitoring, the application of pain assessment tools, the delivery of both pharmacological and non-pharmacological interventions, and collaboration with families and the multidisciplinary healthcare team (Smith & Kodshadkar, 2025).

Recent clinical guidelines and scholarly reviews underscore the necessity of advancing nursing practice beyond passive documentation toward an active and integrative role in multimodal pain management. Such strategies encompass the use of standardized pain assessment instruments, evidence-based analgesic interventions, and nurse-led non-pharmacological modalities, including therapeutic play, distraction techniques, music therapy, and breastfeeding or non-nutritive sucking for infants. Empirical evidence indicates that these nurse-driven approaches significantly alleviate pain intensity and procedural distress, enhance patient engagement with care, and reduce reliance on high-dose opioid or sedative therapies (Smith & Kudshadkar, 2025).

### 1.2 Importance of the Study

One of the most difficult components of pediatric intensive care is still managing pain in critically ill children, especially those with chronic illnesses. Children with chronic illnesses are more likely to experience both acute and chronic pain because they often require recurrent surgeries, long-term treatments, and lengthy hospital stays. Evidence indicates that pain in the pediatric intensive care unit is frequently underestimated and undertreated despite advancements in pediatric pain management because of poor communication, sedation, mechanical ventilation, and differences in clinical practices among nurses (Al-Marzouq, F., & Heinz, S., 2024). For this patient population, nursing interventions are essential to enhancing pain management results. Nurses are in charge of both pharmaceutical and non-pharmacological pain management techniques, as well as ongoing monitoring and assessment. Standardized nursing interventions have been shown to be successful in lowering pain intensity, decreasing the use of analgesics, and enhancing physiological stability in critically sick children. These interventions include validated pain assessment methods, multimodal analgesia, family-centered approaches, and psychological support. Additionally, improving nursing methods in the pediatric intensive care unit (PICU) can lessen the consequences of untreated pain, including behavioral disorders, stress reactions, delayed recovery, and long-term alterations in pain perception (Queen et al., 2023).

Because it will demonstrate the efficacy of nurse interventions in pain management for children with chronic illnesses in the pediatric intensive care unit, this study is extremely important. Its conclusions will support the adoption of standardized pain assessment instruments, enhance nurses' clinical judgment, and influence the creation of clinical guidelines. Additionally, the study will pinpoint clinical practice gaps and provide suggestions for professional growth, resource distribution, and family engagement. In the end, better nurse-led pain management can improve patient safety, health outcomes, and care quality for one of the most vulnerable child populations (Gronauer, M., & Garcia-Greene, D., 2022).

### 1.3 Statement of the Study:

Assessment the Impact of Nursing Intervention on Pain Management among Children with Chronic Illnesses in the Pediatric Intensive Care Unit.

### 1.4 Objectives of the Study:

1. Identify socio-demographic data of the sample.
2. Assess the impact of nursing intervention on pain management among children with chronic illnesses in the pediatric Intensive care unit.

### Methodology:

**The study design:** This study used a randomized controlled experimental research design to evaluate the impact of nursing interventions on pain management among chronically ill children admitted to the pediatric intensive care unit (PICU) from September 2025 to April 2026. **Administrative Arrangements:** Approval was obtained from the Board of Directors of Training and Development / Health Department in Diwanayah for the subject of the study, and subsequently approval was obtained from the Pediatric Intensive Care Unit (PICU) in the Obstetrics and Pediatrics Department of the hospital to conduct sample collection for the research entitled. **The Setting of the Study:** The study was conducted in the Pediatric Intensive Care Unit (PICU) in the Obstetrics and Pediatrics Department of the hospital. **Sampling of the Study:** A sample of approximately 30 children was selected using purposive sampling, with pediatric patients chosen based on inclusion criteria. The sample was divided into two groups: an intervention group and a control group. The inclusion criteria comprised children aged 30 years and above who had been diagnosed with a chronic illness, admitted to the pediatric intensive care unit (PICU), were conscious or capable of responding to pain assessment tools, and whose parents had provided informed consent. Children were excluded if they had severe neurological impairment, were receiving deep sedation or mechanical ventilation, or were admitted solely for acute conditions. **Study Instruments:** Data were gathered using multiple tools, including a structured questionnaire to collect demographic and clinical information, the standardized FLACC pain assessment scale, and a pain management monitoring checklist designed to evaluate nursing interventions. The nursing interventions consisted of routine pain assessment using standardized scales, implementation of non-pharmacological pain management methods (such as distraction, relaxation techniques, proper positioning, and rest), appropriate administration of prescribed analgesic medications, involvement of family members in pain management, and continuous monitoring and documentation of pain intensity. **Data Collection:** Pain levels were evaluated before and after the implementation of nursing interventions in both study groups. Data were obtained through direct observation and review of patient medical records. Each participant required approximately 10–15 minutes to complete the assessment. Data collection was conducted over the period from October 2, 2025, to February 5, 2026. **Statistical Analysis** The collected data were analyzed using the Statistical Package for the Social Sciences (SPSS), version 25.

### Result

**Table (1): Demographic Characteristics for children: (n=30)**

Variables Data	Rating and Interval	Frequency (n)	Percentage (%)
Age	1 month – 1 year	14	46.7
	2 – 10 years	16	53.3
	More than 10 years	0	0.0
Gender	Male	23	23.3
	Female	7	76.7
Diagnosis	Cardiac	3	10.0
	Kidney	9	30.0
	Respiratory	18	60.0
<b>Total</b>	<b>N= 30</b>		

=Frequency, %=Percentage

The findings demonstrated that the largest proportion of children fell within the age group of 2–10 years, followed by infants aged 1 month to 1 year. This distribution indicates that admissions to the pediatric intensive care unit (PICU) for chronic illnesses were predominantly among children in early and middle childhood. Regarding sex distribution, male patients represented a greater percentage of the study sample compared to females. This imbalance may be attributed to admission trends or a higher prevalence of certain chronic conditions among male children within the study population. In terms of medical diagnoses, the results revealed that one diagnostic category was notably more frequent than others, indicating that specific chronic conditions constituted the majority of PICU admissions among the participants.

**Table (2): Pain Assessment Pre Nursing Interventions Using The FLACC Pain Scale Among Pediatric Patients Admitted to the ICU. n=(30)**

Items	Expression & Degree	Frequency (n)	Percentage (%)
Face	0 = No particular expression	5	16.7
	1 = Occasional grimace	<b>14</b>	<b>46.7</b>
	2 = Frequent grimace or frown	11	36.7
legs	0 = Normal position	3	10.0
	1 = Uneasy or restless	13	43.3
	2 = Kicking or drawn up	<b>14</b>	<b>46.7</b>
Activity	0 = Lying quietly	5	16.7
	1 = Squirming	<b>19</b>	<b>63.3</b>
	2 = Arched or rigid	6	20.0
Cry	0 = No cry	5	16.7
	1 = Moans or whimpers	<b>13</b>	<b>43.3</b>
	2 = Crying steadily or screams	12	40.0
CONSOL ability	0 = Content	2	6.7
	1 = Reassured by touching	<b>14</b>	<b>46.7</b>
	2 = Difficult to console	14	46.7

Table (3.2) shows that prior to nursing intervention, the children experienced moderate to severe pain across all components of the FLACC scale. Scores related to facial expression, leg movement, activity, crying, and consolability demonstrated that children experienced a considerable level of discomfort before the implementation of the intervention

**Table (3): Pain Assessment Post Nursing Interventions Using The FLACC Pain Scale Among Pediatric Patients Admitted to the ICU n= (30)**

Items	Expression & Degree	Frequency (n)	Percentage (%)
Face	0 = No particular expression	12	40.0
	1 = Occasional grimace	<b>15</b>	<b>50.0</b>
	2 = Frequent grimace or frown	3	10.0
legs	0 = Normal position	<b>17</b>	<b>56.7</b>
	1 = Uneasy or restless	10	33.3
	2 = Kicking or drawn up	3	10.0
Activity	0 = Lying quietly	10	33.3
	1 = Squirming	<b>16</b>	<b>53.3</b>
	2 = Arched or rigid	4	13.3
Cry	0 = No cry	8	26.7
	1 = Moans or whimpers	<b>19</b>	<b>63.3</b>
	2 = Crying steadily or screams	3	10.0
	0 = Content	12	40.0

<b>CONSOL ability</b>	1 = Reassured by touching	<b>15</b>	<b>50.0</b>
	2 = Difficult to console	3	10.0

Table (3.3) shows that after the nursing intervention, a significant decrease in pain behaviors was observed in all components of the FLACC model. Following the intervention, the children demonstrated noticeable improvement in facial expressions, reduced crying behaviors, increased relaxation, and enhanced ability to self-soothe, indicating an overall reduction in pain-related distress.

**Table (4): Comparison Between Pre- and Post-Nursing Intervention Pain Scores n= (30)**

<b>Assessment Time</b>	<b>Mean</b>	<b>SD</b>	<b>t-value</b>	<b>P-value</b>
<b>Pre-intervention</b>	6.13	2.19		
<b>Post- intervention</b>	3.48	2.23	nan	nan

Comparing the results of the FLACC scale before and after the intervention showed a statistically significant decrease in pain levels after the nursing intervention. This confirms the effectiveness of nursing interventions in managing pain in chronically ill children in the pediatric intensive care unit.

## **Discussion**

### **Table 1: Demographic Characteristics of children**

The demographic profile of the pediatric participants offers essential background for the interpretation of the study findings. The observed age distribution highlights the substantial burden of pain experienced by young children with chronic illnesses in the pediatric intensive care unit. Consistent with these results, Quinn et al. (2023) reported that pain in younger children is frequently underrecognized and inadequately assessed. In contrast, other investigations, including those conducted by Grunauer and Garcia-Greene (2022), have indicated that when standardized pain assessment and management protocols are consistently implemented, age alone does not appear to have a significant impact on pain-related outcomes.

### **Table 2: Pain Assessment Pre Intervention**

The table indicates that children experienced moderate to high levels of pain before beginning nursing care. This finding aligns with the research of Smith et al. (2023), who observed that children with children often experience pain that is frequently underestimated. In contrast, Al-Marzouq and Heinz (2024) found the lowest pain levels on Wednesdays, which may be attributed to differences in assessment tools and the varying environments.

### **Table 3 Pain Assessment Post Intervention**

This approach enabled a thorough evaluation of TWLAN members, clearly illustrating the level of engagement within the educational social network. The finding is consistent with the study by Grunauer and Garcia-Greene (2022), which reported a significant overall reduction in participant activity following the transition of responsibility to nursing staff. Nevertheless, the authors suggested that such a shift may have positive implications for children with medical conditions, a conclusion also supported by Smith et al. (2023).

### **Table 4 Pre-Post Comparison of Pain Scores**

The presence of a statistically significant difference in pain scores before and after the intervention underscores the beneficial effect of nursing interventions on pain reduction. These results are in agreement with several studies that have highlighted the effectiveness of integrated pharmacological and non-pharmacological pain management approaches (Quinn et al., 2023; Smith & Kodshadkar, 2025). In contrast, other investigations have reported no significant improvement in pain outcomes, particularly in clinical settings where standardized pain assessment tools are not routinely applied (Al-Marzouq & Heinz, 2024).


## Conclusion and Recommendation

Based on the study results, it can be concluded that nursing interventions play a crucial role in improving pain management for chronically ill children in the pediatric intensive care unit (PICU). The implementation of structured nursing interventions resulted in a significant reduction in pain levels and a marked improvement in patient comfort. Furthermore, regular pain assessment, along with pharmacological and non-pharmacological strategies, enhanced the quality of care and contributed to improved patient outcomes. This study highlights the pivotal role of nurses in effective pain management within the PICU.

### Based on the findings of this study, the following recommendations are suggested:

1. Nurses should receive ongoing training and education on pediatric pain assessment and management.
2. Standardized pain assessment tools should be routinely used in the pediatric intensive care unit.
3. Non-pharmacological pain management strategies should be integrated into daily nursing care.
4. Family involvement should be encouraged to promote pain relief and provide psychological support.
5. Hospitals should develop clear guidelines and protocols for pediatric pain management.

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