



Pain Management Strategies, Roles and Challenges Among Pediatric Oncology Nurses in Mosul Hospitals

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Abstract Background: This study has shown that Knowledge, attitudes and practices of the nurses in the hospitals in Mosul offer systemic, educational and emotional obstacles of effective management of pain in pediatric oncology. **Methods:** A mixed-methods design was implemented in period between February 18 and July 14, 2025 and it was cross-sectional study. A sample size of 150 nurses working in hospitals in Mosul in pediatric oncology was studied through structured questionnaires, which were used to collect quantitative data concerning demographics, knowledge, attitudes, training and practices of pain management. To enhance knowledge, 15 nurses were purposely selected and interviewed semi-structurally to discuss their Covid-19 experiences, insurance in their ways of thinking, training necessities and emotional problems. To obtain the main patterns, qualitative data were analyzed in a thematic way. **Results:** The majority of the sample were females (78%) relatively with different experience levels and 65.3 percent of them were employees of sector-specific oncology centers. Pharmacologic pain management was also common (92%) and 85 percent of them were trained. Less were used (66.7%) and trained (20%) in the nonpharmacologic methods. There was a significant correlation between Formal training and use of nonpharmacologic ($t = 12.34, p < 0.0001$). Organizational barriers were also lower in nurses that worked in oncology centers than in general pediatrics ($t = 3.45, p = 0.001$). Among the key challenges, one could name staffing shortage (74%), lack of education (63.3%), the issue of opioids (58%) and burnout (46%). The findings offered detailed qualitative roles and the barriers, lack of training and emotional stress in managing pain in children. **Conclusion:** The analysis also reveals that there exist serious training deficiencies, particularly in nonpharmacologic pain management and they require the system to be changed and nurses to be emotionally supported.

Key Words Pain Management, Strategies, Pediatric Oncology, Nurses, Challenges

INTRODUCTION

One of the most common and unpleasant symptoms in children being treated have cancer are pain where almost fifty percent complain of moderate to severe pain. Not only does this pain undermine their physical healing but it also causes much psychological pressure to both the young patients and their relatives [1].

Children with cancer experience complex pain and this is due to a combination of various causes which includes the tumour itself, side effects of the treatment such as mucositis and nerve damage and other invasive medical procedures. Prevention and treatment of such kind of pain involves attentive clinical examination and personalised treatment plans [2].

Even though they are extremely important, a large number of nurses do not receive special training in the field of managing paediatric pain related to oncology [3]. In addition to the education gaps, organisational and systemic

barriers are also present barriers to effective pain management. The inadequate staffing, time management, vague clinical guidelines and concerns about the opioid safety usage can affect the ability of nurses to offer adequate pain management assistance [4].

Use of opioid drug remains a center of treatment of moderate to severe pain in cancer patients of children who are in end-of-life treatment and at the time of undergoing invasive surgeries. The studies take the position in favor of dose-specific opioid prescribing to each paediatric patient and additional methods to protect the pain relief approach and to concomitantly decrease side effects [5,6].

Accurate assessment of pain is the key to effective pain management, which makes it unequal in terms of its usage in healthcare facilities, which is why it is crucial to take into account reliable and age-specific pain assessment measures that consider cognitive and emotional capacities of cancer patients [7].

Nurses working in paediatric oncology have been the paramount focus in pain management, with a continued evaluation of pain and administration of either pharmacologic or non-pharmacologic therapy. Other than in their clinical responsibility, such nurses play the role of advocates who can be used to initiate dialogue between children and their families and the multidisciplinary healthcare team thus leading to whole child care [8].

Besides, oncology nurses working in paediatrics face people with risk of compassion fatigue and professional burn out particularly because of the emotional and psychological demands of high intensity exhibited in the job they are undertaking. These experiences could negatively affect their ability to offer quality pain management, which is emphasised by the organisational support of the patient and access to mental health [9].

The role played by the pediatric oncology nurses cannot be overlooked since they deal with pain although the gaps in training, institutional support and emotional support remains unaddressed. Within the context of this paper, the researcher tries to thoroughly examine these complex problems with an effort of formulating evidence-based interventions that can benefit education and serve as a policy guide and on a wider view facilitate multimodal approach in the management of pain. It is important that the mentioned problems are tackled so that the power of nursing could be improved, pain management could become more efficient and, ultimately, the quality of lives of a child with a cancer could be made better.

Concerning such ongoing issues as educational discrepancies, organizational problems, inconsistent pain assessment and emotional leftovers, this study will examine the contemporary practice that relates to curbing pain among the pediatric oncology nurses. It will also assess nurses' perception on the barriers to their work and willingness to adopt holistic solutions whose objective is to guide the work in enhancing the competence of nurses and management of the quality of pain in pediatric with cancer.

Aim

This study aimed to evaluate the pain management strategies in pediatric oncology nurses' role and challenges.

Objectives

- To determine the mechanical methods of pain management, which refer to both medications-based and non-medication assisted methods to alleviate pain, as adopted by the pediatric oncology nurses on a daily basis
- To identify the connection between formal training and the use of non-medication pain relief strategies among pediatric oncology nurses
- To compare the obstacles to effective management for pain as professed by nurses that working in specialized pediatric oncology centers versus those in general pediatric wards

- To understand pediatric oncology nurses' perspectives and experiences related to their professional roles, educational needs, systemic difficulties and the emotional impact of managing pain in children

METHODS

Research Design

This was a mixed methods design research type that was conducted to assess the role of paediatric oncology nurses in the management of pain and the challenges they face. The cross-sectional survey was used to gather quantitative data, which presents breadth. The semi-structured interviews were used to retrieve qualitative data, which are deep. The separate analysis and subsequent integration of these datasets allowed for a comprehensive understanding of clinical practices and contextual experiences related to pediatric pain care.

The study was conducted at special oncology units and typical pediatric units of the Mosul Hospitals throughout the five months i.e. between 18 of February up to July 14, 2025. The first few months were used to make initial preparation like the ethical approval to be sought and how the instrument is to be developed. The main data collection method which is quantitative surveys took place in the quantitative section of data and the main data collection method on 20th of March through to 9th of April 2025 was qualitative interviews. Such analysis of data was conducted between 10 to 28 of April/2025 and the interpretation and the final reports of this research was done in the 12 of June/2025. It is a chronology which enabled to perform wholesome ethical research of high methodological accuracy and standards followed in the process of the research.

Study Population and Sampling

The researcher has covered registered nurses, who are employed in pediatric oncology departments and the general pediatrics units who deal with oncology cases within the hospitals of Mosul. To complete the survey, 150 nurses were chosen by the purposive sampling method by using G*Power and also Epi Info Software to determine the sample size and the sample was heterogeneous in terms of clinical practice environment and the different experience levels of the participants. There were eligibility criteria according to which nurses needed to must have a minimum one years' experience in pediatric oncology nursing in order to provide the participants with significant access to the realities of pain management in a specific care setting. Out of this pool, 15 nurses were selected through a careful selection and interviewed in details with the view of creating a wide scope in terms of experiences and working conditions to have a detailed information.

Data Collection Instrument

A questionnaire has been developed on the basis of the critical overview of recent literature devoted to the study of pediatric pain management and nursing duties, such as papers by Liu *et al.* [10], Li *et al.* [11] and Baalann *et al.* [12].

The items were designed on important domains of pain management practice, including all the medications and non-medications interventions, the frequency of pain assessment and the perceived challenges. An expert opinion was used to make the survey more transparent and topical. Furthermore, the interview guide concerning the perceptions of nurses on the role they play in pain management, the emotional implication of their tasks and the factors in their organizational setting that facilitate or deter their performance was developed.

Validity

The definition of content validity was by a panel of 15 experts comprising of paediatric nursing oncology specialists and pain management researchers who looked through the questionnaire and interview guide to make sure that they were comprehensive and appropriate. The tools were found to be effective to cover the intended topics in this review. It used pilot interviews where the qualitative questions were tested on their clarity and relevance and, hence, some minor adjustments were made to enhance the clarity among the participants.

Reliability (Pilot Study)

They were not included of the pilot study sample was 15 paediatric oncology nurses in the main study and the reliability of the questionnaire was tested using a single test between the 12-13 of April/2025. Cronbach alpha was used to measure internal consistency and with the result of (0.83), evinces reliable measurement.

Data Collection Period

Data collection of this research was conducted over a four-month period, from 20 of March to 9 of April 2025, allowing sufficient time to engage a representative sample of pediatric oncology nurses. The quantitative phase occurred first, from 20 of March to 2 of April 2025, using structured questionnaires distributed both electronically and in print. The qualitative phase followed from 2 to 9 of April 2025, involving semi-structured interviews with a purposive subset of survey participants. Interviews were conducted via face to face depending on the convenience of the participants. This gradual yet partly overlapping procedure was able to introduce the interim findings of the survey into the interview process, thereby boosting the density as well as uniformity of the findings of the study.

Data Analysis

A quantitative data under analysis was started with the help of descriptive statistic expression, such as means, standard deviation, frequencies and percentages, to characterise the sample and provide some idea about the process of pain management and the challenges being on its way. The possibilities of association of influencing variables such as the chi-square tests and the independent t-tests were then tested using inferential statistical techniques such as comparing the pain management practises between the

nurses who had different levels of formal training. At the level of 0.05, statistical significance was observed. The qualitative data was analysed using a thematic analysis grounded on the framework of Braun and Clarke that included the systematic coding, pattern identification and developing themes that presented the experiences and perceptions of nurses. The combination of qualitative and quantitative findings was done by triangulation which gave a detailed description of the multifaceted problems in the management of paediatric pain in oncology Data were assessed using SPSS (Version 26) software.

RESULTS AND DISCUSSION

The participant demographics in Table 1 outline the characteristics of demographic for pediatric oncology nurses. The majority of participants were gender female (78% or 117 nurses). Regarding experience, 42% (63 nurses) had more than 7 years of work experience, while 40% (60 nurses) had 3-7 years and 18% (27 nurses) had less than 3 years. Most participants (65.3% or 98 nurses) worked in specialized pediatric oncology centers, while the remainder (34.7% or 52 nurses) were from general pediatric units. This tendency in the results coincides with the results provided in the literature Zuo *et al.* [13], whose study on Jordanian oncology nurses showed that 74.8% of the participants were female and a significant proportion (45.5%) had over 5 years of oncology-related experience. Additionally, their research revealed that 61% of nurses worked in specialized oncology hospitals, reflecting a similar pattern of specialization among experienced nursing staff [13].

As displayed in Table 2, the overall level of knowledge regarding the management of pain indicates the different levels of knowledge among the involved nurses. Fifty percent (50 percent or 75 nurses) of the nurses were good and 30 percent (45 nurses) were at an acceptable level. The poor level of knowledge was observed in a smaller sample (20 percent or 30 nurses). The chi-square test showed that the difference in the level of knowledge was statistically significant ($\chi^2 = 10.26, p = 0.0059$) thus showing that there was a significant difference among the knowledge of the nurses regarding pain management. Jamal *et al.* [14] support these findings by evaluating the attitudes of nurses having the Jordanian knowledge of the pain management. Their findings revealed that few nurses (52) by their scores obtained a satisfactory score on pain knowledge evaluation whereas 48% nurses obtained limited or poor scores. The gaps in the pain management approach based on both pharmacological and non-pharmacological methods were highlighted in the study and the need to focus on specific educational interventions to improve clinical competencies [14].

The overall attitude level about pain management as portrayed in Table 3 shows that most of the nurses (63.3 or 95 nurses) were of the positive attitude towards the pain management. Only 26.7% (40 nurses) of the respondents were neutral and the remaining 10 percent (15 nurses) were reported to be having a negative attitude. Chi-square value ($\chi^2 = 33.92, p = 0.0000$) indicates that difference between

Table 1: Statistical Results for Participant Demographics (N = 150)

Characteristic		Frequency	Percentage
Gender	Female	117	78.0
	Male	33	22.0
Years of Experience	<3 years	27	18.0
	3-7 years	60	40.0
	>7 years	63	42.0
Work Setting	Specialized Pediatric Oncology Center	98	65.3
	General Pediatric Unit	52	34.7
Total		150	100%

Table 2: Statistical Results for Total Knowledge Level about Pain Management-Detailed Results (n = 150)

Knowledge Level	Frequency	Percentage	χ^2	p-value
Poor	30	20.0	10.26	0.0059
Acceptable	45	30.0		
Good	75	50.0		
Total	150	100		

χ^2 = Chi-square, Significant at p-value ≤ 0.05 level

Table 3: Statistical Results for Total Attitudes Level toward Pain Management (n = 150)

Attitude Level	Frequency	Percentage	χ^2	p-value
Positive Attitude	95	63.3	33.92	0.000
Neutral Attitude	40	26.7		
Negative Attitude	15	10.0		
Total	150	100		

χ^2 = Chi-square, Significant at p-value ≤ 0.05 level

Table 4: Statistical Results for Pain Management Strategies Used by Nurses (N = 150)

Strategy	Frequency	Percentage	Formal Training (%)
Pharmacologic interventions	138	92.0	85.0
Nonpharmacologic interventions	85	56.7	22.0
Routine use of pain assessment tools	102	68.0	N/A
Informal or observational assessments	48	32.0	N/A

Table 5: Statistical Results for Challenges in Pain Management Reported by Nurses (N = 150)

Challenge	Frequency	Percentage
Inadequate staffing/time pressure	111	74.0
Lack of pediatric pain training	95	63.3
Concerns about opioid side effects	87	58.0
Emotional exhaustion/compassion fatigue	69	46.0

the categories is very significant that indicates that the participants are oriented generally in the positive direction. The finding is consistent with other similar research; in the study conducted by Alshahrani and Baig, it is revealed that 68% of nurses expressed positive attitudes towards pain management, 22% expressed neutral attitudes and 10% expressed negative attitudes, yet they insisted that constant education was important to retain these positive perceptions towards pain management.

The Table 4 which displays the pain management strategies that nurses employed indicates that pharmacologic interventions have been identified as the most common method employed by the nurses with 92% reportedly employing this method and a high rate of formal training indicates that 85 percent of those who employed it had formal training. Conversely, 56.7% (85 nurses) used nonpharmacologic intervention but not all of them (22 percent) had formal training on the interventions. Sixty-eight percent (68) of the nurses said they used standardised pain assessment tools on a regular basis (102 nurses) and 32 percent (48 nurses) said they used informal or observational assessment tools. By the support

of such findings, Fekede *et al.* [15] found that 90 percent of the nurses employed pharmacologic techniques in controlling pain; 80 percent were trained to use the techniques; 55 percent utilised nonpharmacologic techniques and only 25 percent were trained. Moreover, 70% regularly utilised standardised pain assessment instruments and this fact shows that there was a steady trend in the application and lack of training in the area of nonpharmacologic methods of pain management.

The statistical relationships between the study findings as they are represented in Table 5 elaborate the issues that nurses encounter when dealing with paediatric pain. The least reported problem was insufficient staffing and press of time that was mentioned by 74% (111 nurses). The absence of paediatric training on pain was reported by 63.3% (95 nurses) and 58% (87 nurses) were concerned with the side effects of using opioids. Other notable items were emotional exhaustion and compassion fatigue that were reported by 46% (69 nurses). The results are in line with those of Hougaard and Smeland [16], who stated that staffing shortages, time constraints, inadequate preparation on pain management among nurses were mentioned by 70 percent

Table 6: Statistical Results for Associations Relationship between the Results of the Study

Variable	Statistic	Value	p-value
Formal training vs. use of nonpharmacologic strategies	Chi-square (χ^2)	12.34	0.001
Work setting (oncology center vs. general) vs. organizational barriers	t-test (t)	3.45	0.001

Significant at p-value ≤ 0.05 level

Table 7: Themes Identified from Qualitative Interviews (N = 15)

Theme	Description	Sample Quote
Role Complexity	Nurses describe their pain management role as multifaceted, including clinical care and emotional support.	"We are not just giving meds; we support the whole family."
Training Deficits	Participants noted a lack of specific education on pediatric oncology pain management.	"I want more hands-on training on new pain relief methods."
Systemic Barriers	Challenges include insufficient time, unclear protocols and limited team collaboration.	"Protocols are vague and time is never enough to manage pain properly."
Emotional Toll	Burnout and compassion fatigue negatively impact nurses' ability to provide care.	"Sometimes I feel overwhelmed and emotionally drained."

and 65 percent of nurses, respectively and insufficient paediatric pain education and a fear of opioid side effects were indicated by 55 percent and 55 percent of nurses correspondingly. Also, emotional burnout had touched close to 50 percent of the surveyed nursing personnel.

The nursing pain management challenges mentioned by nurses as indicated in Table 6 summarise important statistics associations. There was a significant correlation between the use of nonpharmacologic strategies and formal training ($\chi^2 = 12.34$, $p < 0.001$), therefore training could have a beneficial effect on the adoption of various pain management strategies. Also, nurses in more oncology centres noted much fewer organisational barriers than those in a more general paediatric units ($t = 3.45$, $p = 0.001$). These findings can be supported by the data that Yuan [17] found that nurses who received formal education in pain management were twice as likely to use nonpharmacologic interventions ($\chi^2 = 10.87$, $p = 0.001$) and that those nurses that were working in specialised units had less systemic barriers than nurses working in general wards ($t = 2.98$, $p = 0.004$).

As indicated in the qualitative interviews of 15 participants, the themes of the themes identified reveal four major themes as indicated in Table 7. Role Complexity was also created as the nurses explained that their roles were not limited to clinical work and that they were also to provide emotional support to their patients and families. Training Deficits highlighted the high levels of specialisation and desire among the nurses towards more practical training in handling pain. Systemic Barriers were also cited frequently and it included lack of time and absence of clear standardised protocols. Finally, the theme of the Emotional Toll was accountable to reflect the emotional stress the nurses dealing with paediatric pain management undergo due to the cancer-related situation, in particular. Such revelations are in line with those in the paper by Ay *et al.* [18], who similarly identified the themes in their qualitative study of pediatric oncology nurses, informing on their constantly complicated and emotionally taxing character and the urgency of the improved training and organizational reinforcement.

CONCLUSIONS

There was a higher frequency of having formal training of pharmacologic methods but status was significantly

lower in the nonpharmacologic practices, which means that there is a necessity to broaden the educational activities.

Among the issues mentioned in the reports given by nurses were shortages of staff members, lack of the devoted compensation, feared opioid addiction and individual burnout, illustrating the necessity to change the entire system and provide improved education. Formal training was also associated with increased nonpharmacologic management of pain and it, therefore, showed the importance of specific education in order to expand therapeutic choice. There were also less organizational barriers experienced on the part of the nurses operating on specialized oncology unit than that experienced in general pediatric wards, which consequently mean better institutional support within the specialized settings.

Qualitative results showed the multiplicity of the nursing profession, training-gap, institutional challenges and emotional pressure, indicating the need to provide nurses with full support services.

Recommendations

- Include pain management topics in the ongoing nurse education, as part of the continuing professional development, the assessment and treatment of pain in children becomes a compulsory aspect of continuing professional development, especially within the nurses in general units of pediatrics
- Enhance the organizational support of pain management in general pediatric practices by meeting such challenges as the shortage of staff and lack of specific procedures to improve the pain management practice beyond specialized centers
- Create and disseminate evidence-based and clear guidelines on pain management that correspond to the needs of different settings of pediatric care environments
- Promote collaboration among healthcare professionals-nurses, doctors and psychologists-to deliver comprehensive, team-based pain care for children
- Regularly monitor and evaluate the effectiveness of training programs in clinical practice, making adjustments as needed to maintain and improve outcomes

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Conflicts of Interest

Authors confirm that this research has no interest conflicts involved.

Ethical Approval

This study was conducted following ethical approval from Collegiate Committee for Medical Research Ethics/ University of Mosul (Code: CCMRE-Nu-25-128). Subsequent approvals were also obtained from the Ethics Committee of the Nineveh Health Directorate and from the administrations of all hospitals in Mosul City that participated in the study.

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