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Original Research Article

Knowledge Levels of Nurses Regarding Pediatric Pain Management in Children's Hospitals in Iraq: The Case of Al-Hilla

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Abstract: ***Aim***: This study was conducted to evaluate the knowledge levels of nurses working in children's hospitals in Al-Hilla, Iraq, regarding pain management in children and to examine certain variables associated with knowledge levels. ***Method***: This descriptive cross-sectional study was carried out with nurses working in pediatric units of three children's hospitals in Al-Hilla. The study sample consisted of 255 nurses. Data were collected using the Introductory Information Form and the Nurses' Knowledge Form on Pain Management in Children. Descriptive statistics and the chi-square test were used for data analysis. ***Results***: The overall level of knowledge regarding pain management among nurses was found to be moderate. The lowest level of knowledge was identified in the subdimension related to nursing care for children experiencing pain. Statistically significant relationships were found between knowledge scores and educational level as well as the unit in which the nurses worked. Nurses working in pediatric emergency units, neonatal units, and pediatric intensive care units had higher knowledge scores. ***Conclusion***: The results of the study indicate a need to improve the knowledge levels of nurses working in pediatric units regarding pain management. Strengthening structured educational programs and standard practice guidelines, particularly those focusing on nursing care and pain assessment, is recommended.

Keywords: Child, Pain Management, Nursing, Pediatrics, Iraq.

1. INTRODUCTION

Pain is defined as an unpleasant sensory and emotional experience associated with actual or potential tissue damage (WHO, 2023; Williams & Craig, 2016). The meaning attributed to pain is shaped particularly by injuries experienced during childhood, learned experiences, and memories, and these early experiences play a determining role in an individual's pain perception and coping styles later in life (Walco *et al*., 2016; Noel *et al*., 2012). Although pain is often perceived as a negative experience, it functions as a fundamental warning system for the organism and serves as an indispensable indicator that initiates the search for treatment (Williams & Craig, 2016).

Pain is highly prevalent during childhood and constitutes an integral part of the growth and developmental process, as well as experiences related to illness and hospitalization. It has been reported that approximately 40% of children and adolescents experience pain at least once a week, while 15–20% report chronic pain (Groenewald *et al*., 2012). Children and adolescents also represent a substantial proportion of emergency department admissions, with nearly 70% of this population experiencing moderate to severe pain (Wente, 2013). Given that pain experiences in childhood form the foundation of pain perception in adulthood, the quality of pain assessment and management approaches implemented during this period is of critical importance (Walco *et al*., 2016).

Accurate assessment and effective management of pain in children are fundamental requirements for both children and their families. Children's responses to painful experiences vary according to their cognitive, emotional, and physical developmental levels (Twycross & Finley, 2013). Considering that painful experiences may also shape a child's first and lasting interactions with healthcare professionals, this process must be approached with particular sensitivity (Olmstead *et al*., 2010). Evidence suggests that positive early experiences in pain management play a protective role against increased pain sensitivity in adulthood (Noel *et al*., 2012). Nevertheless, studies consistently indicate that

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pain in children is frequently underrecognized and inadequately treated (Taylor *et al*., 2008; Zunino *et al*., 2018). Barriers to effective pediatric pain management include healthcare professionals' lack of knowledge, misconceptions, limited resources, and cultural factors (Johnson *et al.*, 2015; Aziato & Adejumo, 2014). Misbeliefs such as the assumption that children have limited pain perception, will not remember pain, or that pain is necessary for development may contribute to the underestimation of pain and insufficient treatment (Olmstead *et al*., 2010; Ortiz *et al*., 2012).

Concerns regarding adverse effects and fear of addiction related to opioid use constitute a major barrier in pediatric pain management and may result in children not receiving adequate analgesic treatment (de Freitas *et al*., 2014; Peirce *et al*., 2018). Untreated or inadequately managed pain has been associated with a range of physiological and psychological consequences, including cardiovascular and respiratory complications, impaired immune function, delayed recovery, a tendency toward persistent pain, anxiety, and depression (Zunino *et al*., 2018; Walco *et al*., 2016). Pain management is a complex process that encompasses pharmacological and non-pharmacological approaches and requires systematic assessment and professional expertise (Twycross & Williams, 2023; Miftah *et al*., 2017). Within this process, nurses occupy a key position, as they spend the most time with children and play an active role in painful procedures (Ekim & Ocakcı, 2013).

Nurses' competence in pain management develops through formal education, in-service training, and clinical experience. Accurate pain assessment, appropriate use of measurement tools, and continuous monitoring of intervention effectiveness constitute the core components of this process (Wang & Tsai, 2010; Loeser & Treede, 2008). However, particularly in low- and middle-income countries, insufficient knowledge, limited clinical guidelines, and inadequate training programs related to pediatric pain management remain significant challenges (Aziato & Adejumo, 2014; Goucke & Morriss, 2012). A review of the literature indicates that studies examining the knowledge levels of nurses working in pediatric units in Iraq with regard to pain management are limited. Most available evidence originates from other countries, and data reflecting regional and cultural contexts remain scarce (Miftah *et al.,* 2017; Alotaibi *et al*., 2019). This gap highlights the need for research aimed at determining the pain management knowledge levels of nurses working in children's hospitals in Iraq. Such studies are essential for describing the current situation, identifying misconceptions, and informing the development of targeted educational programs.

2. MATERIALS AND METHODS

2.1. Study Design and Aim

This study was designed as a descriptive and cross-sectional investigation conducted to determine the knowledge levels of nurses working in children's hospitals in the city of Al-Hilla regarding pain management in children. Descriptive cross-sectional studies are considered an appropriate method for identifying the existing situation at a specific point in time and for assessing knowledge levels. The aim of this study was to identify nurses' levels of competence in pediatric pain assessment, pharmacological and non-pharmacological interventions, and nursing responsibilities related to pain management.

2.2. Population and Sample

The population of the study consisted of nurses working with pediatric patients in hospitals providing healthcare services for children in Al-Hilla, Iraq. Three hospitals provide pediatric care in Al-Hilla, employing a total of 640 nurses. The sample size was calculated using the known population sample calculation method with a 95% confidence interval and a 5% margin of error, and at least 241 nurses were determined to be sufficient for the study sample. Stratified sampling based on hospitals was used to select participants. Inclusion criteria were working as a nurse in a department providing services for children in hospitals in Al-Hilla, volunteering to participate in the study, being 18 years of age or older, and being able to read and write in Arabic. A total of 255 nurses participated in the study.

2.3. Data Collection Procedure

The study was conducted in three hospitals providing pediatric services in the city of Al-Hilla. These included a specialized children's hospital providing services exclusively for children, a maternity and children's hospital offering care for women and children, and a multidisciplinary teaching hospital. Including hospitals with different service structures enabled the evaluation of nurses' knowledge levels regarding pain management across diverse clinical contexts. The study was initiated after obtaining approval from the ethics committee and the required institutional permissions. Participants were informed about the study and invited to participate. After informed consent was obtained from nurses who met the participation criteria and volunteered to take part, the data collection tools were administered face to face. Data collection was completed after reaching a predetermined number of nurses from each hospital through stratified sampling. Completion of the questionnaires took approximately 10–15 minutes.

2.4. Data Collection Tools

The Introductory Information Form and the Nurses' Knowledge Form on Pain Management in Children were used as data collection tools.

The Introductory Information Form was developed to identify the sociodemographic and professional characteristics of the nurses.

The Nurses' Knowledge Form on Pain Management in Children was developed in line with the

literature to reflect the multidimensional nature of pediatric pain management. The literature indicates that pediatric pain management includes accurate pain assessment, knowledge of pharmacological and non-pharmacological methods, planning of nursing interventions, and recognition of complications related to analgesic medications (Akcan & Polat, 2017; Eroğlu & Arslan, 2018; Özçevik & Ocakcı, 2019). In addition, the importance of individualized and multimodal approaches in pediatric pain management has been emphasized (Sharon & Czarnecki, 2021; Baş *et al*., 2016). The form used to evaluate nurses' knowledge and attitudes regarding pain management in children consisted of five sections: general information, pain assessment in children, pharmacological and non-pharmacological pain management, nursing interventions for children experiencing pain, and complications of analgesic medications. Responses were recorded by selecting the correct option from multiple-choice answers or by indicating whether statements were true or false. Each correct response was scored as 1 and each incorrect response as 0, and a total score was calculated by summing all items. At the end of the analysis, the total Cronbach's alpha value of the questionnaire was calculated as 0.808.

2.5. Data Analysis

Descriptive statistics were used to evaluate nurses' knowledge of pediatric pain management using statistical software (SPSS). Analyses were performed based on the scores obtained for each question, section, and total scale score. The construct validity and Cronbach's alpha coefficients of the pain management scale items were examined. The chi-square test was applied to assess the relationship between nurses' introductory characteristics and their pain management knowledge levels, and a p value of less than 0.05 was considered statistically significant.

2.6. Validity and Reliability of the Data

To evaluate the validity, content, and applicability of the questionnaire developed to assess nurses' knowledge levels regarding pain management, two versions of the instrument in Arabic and English were sent to 10 experts in the field of child health and diseases. These experts were faculty members at the Nursing Schools of Babylon University, Al-Kufa University, Karbala University, and Baghdad University. Revisions were made after reviewing expert feedback related to clarity and content appropriateness. Ensuring content validity in measurement tools developed for complex clinical areas such as pediatric pain management enhances the reliability of the findings (Akcan & Polat, 2017; Özçevik & Ocakcı, 2019). Subsequently, a pilot study was conducted with 20 nurses. The acceptable Cronbach's alpha coefficient obtained in the pilot study indicated adequate internal consistency of the measurement tool. The Cronbach's alpha coefficient for the total scale was 0.808.

2.7. Ethical Considerations

Ethical approval for the study was obtained from the Ahi Evran University Non-Interventional Research Ethics Committee (27.09.2022, Decision No.: 2022-17/154). Prior to data collection, written permission was obtained from the Iraqi Ministry of Health and the Babylon Health Directorate. Before completing the questionnaires, informed consent was obtained from all participants. The informed consent form was either read by the participants themselves or read aloud by the researcher, and verbal and written consent were obtained.

3. RESULTS

The mean age of the nurses participating in the study was 29.20±7.88 years, with an age range of 20–57 years. The majority of participants (69.8%) were in the 18–30 age group. Regarding gender distribution, 62% of the nurses were female. It was determined that 71% of the participants were married and 43.9% had children. In terms of educational level, 43.1% of the nurses held a bachelor's degree in nursing. A substantial proportion of the participants resided in urban areas (78%), and most did not report having any chronic disease (78%).

With respect to professional characteristics, the majority of nurses were employed at Babylon Maternity and Children's Hospital (56.9%). Of the participants, 43.9% worked in pediatric wards and 57.6% were assigned to daytime shifts. The mean duration of professional experience was 7.11±6.92 years, ranging from 1 to 29 years, with most nurses having 1–4 years of experience. Approximately half of the sample had participated in a special training program or course related to pain management in children. In addition, most nurses reported that they liked the nursing profession (92.2%) and did not intend to change their profession (86.3%).

Table 1: Distribution of Nurses' Knowledge Levels Regarding Pain Management in Children

Subdimensions	**Correct Response Rate (%)**	
	%	**Knowledge Level**
General knowledge	51.06	Moderate
Pain assessment in children	46.90	Moderate
Pharmacological and non-pharmacological interventions	57,64	Moderate
Nursing care for children experiencing pain	33,96	Low
Complications of analgesic medications	51,68	Moderate
Total scale score	**48,25**	Moderate

The knowledge levels of nurses regarding pain management in children were evaluated based on correct response rates across the subdimensions of the scale and the total score. The overall total score of the scale was 48.25%, which was classified as a moderate level of knowledge. Among the subdimensions, the highest correct response rate was observed in the pharmacological and non-pharmacological interventions subdimension (57.64%). Knowledge levels were also moderate in the general information (51.06%), pain assessment in children (46.90%), and complications of analgesic medications (51.68%) subdimensions. In contrast, the subdimension related to nursing care for children experiencing pain had a correct response rate of 33.96%, indicating a low level of knowledge in this area (Table 1).

Table 2: Relationship Between Nurses' Sociodemographic Characteristics and Total Knowledge Score

Variables		**Total knowledge score of the scale**				
		Low	**Moderate**	**High**	**Total**	**P value**
		n (%)	**n (%)**	**n (%)**	**n (%)**	
Age	18-30 yaş	52(29,2)	107(60,1)	19(10,7)	178(69,8)	0,273
	30-39 yaş	10 (22,7)	25(56,8)	9(20,5)	44 (17,3)	
	>40 yaş	13(39,4)	16(48,5)	4(12,1)	33(12,9)	
Gender	Male	24(24,7)	62(63,9)	11(11,3)	97(38,0)	0,321
	Female	51(32,3)	86(54,4)	21(13,3)	158(62,0)	
Marital Status	Single	26(35,1)	43(58,1)	5(6,8)	74(29,0)	0,139
	Married	49(27,1)	105(58,0)	27(14,9)	181(71,0)	
Having children	Yes	42(29,4)	86(60,1)	15(10,5)	143(56,1)	0,510
	No	33(29,5)	62(55,4)	17(15,2)	112(43,9)	
Educational level	Middle school	27(55,1)	18(36,7)	4(8,2)	49(19,2)	***0,000****
	Associate degree	31(41,3)	49(33,1)	16(50,0)	96(37,6)	
	Bachelaor	17(15,5)	81(73,6)	12(10,9)	110(43,1)	
Place of residence	Urban	16(21,3)	34(13,3)	6(2,4)	56(22,0)	0,861
	Rural	59(29,6)	114(57,3)	26(13,1)	199(78,0)	
Chronic disease	Yes	11(34,4)	20(62,5)	1(3,1)	32(12,5)	0,221
	No	64(28,7)	128(57,4)	31(13,9)	223(87,5)	

Table 2 presents the relationship between nurses' sociodemographic characteristics and total knowledge scores. Educational level was found to be a statistically significant factor, with nurses holding a bachelor's degree demonstrating higher correct response rates regarding pain management.

Table 3: The relationship between nurses' professional characteristics and total knowledge score of the scale

Variables		**Total knowledge score of the scale**				
		Low	**Moderate**	**High**	**Total**	**P value**
		n (%)	**n (%)**	**n (%)**	**n (%)**	
Hospital worked	Al-Noor	9(18,0)	35(70,0)	12(12,0)	50(19,6)	0,062
	İmam Sadık	13(21,7)	39(65,0)	8(13,3)	60(23,5)	
	Babil	53(36,6)	74(51,0)	18(12,4)	145(56,9)	
Professional experience (years)	1-4	33(26,8)	78(63,4)	16(9,8)	123(48,2)	0,449
	5-9	19(32,8)	32(55,2)	7(12,1)	58(22,7)	
	10-19	14(28,6)	25(51,0)	10(20,4)	49(19,2)	
	20-30	9(36,0)	13(52,0)	3(12,0)	25(9,8	
Unit worked	Pediatric emergency unit	5(14,7)	24(70,6)	5(14,7)	34(13,3)	**0,000***
	Sterile neonatal unit	2(7,1)	24(85,7)	2(7,1)	28(11,0)	
	Pediatric ward	44(39,3)	62(55,4)	6(5,4)	112(43,9)	
	Intensive care unit	6(14,3)	20(47,6)	16(38,1)	42(16,5)	
	Neonatal unit	18(46,2)	18(46,2)	3(7,7)	39(15,3)	
Work schedule	Day shift	46(31,3)	85(57,4)	16(10,9)	147(57,6)	0,552
	Evening shift	29(31,8)	63(62,7)	16(13,6)	108(42,4)	
Participation in training	Yes	32(28,6)	61(54,5)	19(17,0)	112(43,9)	0,166
	No	43(30,1)	87(60,8)	13(9,1)	143(56,1)	
Number of trainings	1	9(23,6)	23(60,5)	6(15)	38((14,9)	0,572
	2	6(15,7)	14(36,8)	8(21,0)	28(10,9)	
	3 and above	17(36,9)	24(52,1)	5(10,8)	46(18,0)	

As shown in Table 3, a statistically significant difference was identified between nurses' professional characteristics and total knowledge scores according to the unit in which they worked. Nurses working in pediatric emergency units, sterile neonatal units, and intensive care units were found to have higher knowledge scores.

4. DISCUSSION

Reducing the suffering experienced by children during acute and chronic pain processes and preventing pain-related complications is a fundamental right to care. In this context, nurses represent a key professional group responsible for ensuring children's access to safe and effective pain management. For pediatric pain management to be carried out effectively, it is essential to identify nurses' knowledge levels regarding pain assessment, pharmacological and non-pharmacological methods, and nursing interventions (Williams & Craig, 2016; Sharon & Czarnecki, 2021). In the present study, the finding that approximately half of the nurses had not participated in any specific training or course related to pain management in children highlights an important area for institutional improvement. Similarly, in different settings, the lack of regular training has been reported as a factor that negatively affects knowledge levels and the standardization of clinical practices (Panlican *et al*., 2020; Miftah *et al*., 2017).

In this study, nurses' overall knowledge level regarding pain management was found to be moderate, based on the total scale score (48.25%). This result is consistent with findings from previous studies reporting low to moderate knowledge levels among nurses (Ekim & Ocakcı, 2013; Lunsford, 2015; Dongara *et al*., 2015). In contrast, some studies have reported higher knowledge levels. These variations may be attributed to differences in the content of measurement tools, the distribution of participants across clinical units, the presence of established pain management protocols, and the implementation of regular training programs within institutions (Alotaibi *et al*., 2019; Wari *et al*., 2021). Examination of the subdimensions revealed that the higher correct response rate in the pharmacological and non-pharmacological interventions domain (57.64%), compared with other areas, suggests that nurses' pain management knowledge is more strongly oriented toward treatment and procedural aspects. The literature similarly indicates that nurses tend to be more familiar with pharmacological practices but may experience difficulties integrating this knowledge into systematic assessment processes and planned nursing care (Carlsen Misic *et al*., 2021; Perry *et al.,* 2018). Awareness and routine use of non-pharmacological methods have also been shown to be closely related to institutional culture, time constraints, and educational opportunities (Uğurlu, 2017; Kia *et al*., 2021).

The lowest correct response rate in this study was observed in the subdimension related to nursing care for children experiencing pain (33.96%), representing a critical finding. This result suggests that although nurses possess some knowledge regarding what should be done in pain management, they encounter considerable difficulties in core components of the care process, including nursing responsibilities, intervention planning, monitoring, and evaluation. The lack of structured nursing care in pediatric pain management has been associated with role ambiguity, workload, absence of standard guidelines, and ineffective use of pain assessment tools (Aziznejadroshan *et al*., 2015; Simons & MacDonald, 2004; Costa *et al*., 2017). These findings indicate that pain management in pediatric services should not be limited to analgesic administration alone and underscore the need for educational content that places nursing care at the center of pain management practices (Sharon & Czarnecki, 2021; Baş *et al*., 2016).

The moderate level of knowledge observed in the pain assessment subdimension (46.90%) indicates that this stage remains an area requiring further development. Pain assessment constitutes the foundation of effective pain management, and without appropriate scale selection and regular documentation, the effectiveness of interventions cannot be adequately monitored (Loeser & Treede, 2008). Although nurses may be familiar with pain assessment tools, these tools are often not sufficiently incorporated into routine clinical practice due to factors such as time constraints and the absence of standardized assessment procedures (Carlsen Misic *et al*., 2021; Simons & MacDonald, 2004).

In this study, the subdimension related to complications of analgesics demonstrated a moderate level of knowledge overall (51.68%). However, the lower accuracy observed in items related to opioid use is particularly noteworthy in terms of safe analgesic practices. The literature emphasizes that insufficient use of opioids due to fear of side effects and addiction may hinder effective pain control and that attitudes resembling opioid fear can negatively influence the quality of care provided (de Freitas *et al.,* 2014; Peirce *et al*., 2018). Accordingly, in-service training programs should address not only pharmacological knowledge but also safe opioid management, appropriate indications, and monitoring practices.

The relationship analyses conducted in this study revealed significant differences between nurses' knowledge levels and both educational level and the unit in which they worked. Higher knowledge scores among nurses with a bachelor's degree support the contribution of formal education to pain management competence (Wang & Tsai, 2010; Lulie *et al*., 2022). Additionally, nurses working in more specialized units such as pediatric emergency departments, neonatal units, and pediatric intensive care units demonstrated higher knowledge scores. This finding may be explained by increased exposure to painful procedures, greater

involvement in clinical decision-making, and more effective unit-based learning in these settings (Wari *et al*., 2021; Laures *et al*., 2019). Nevertheless, this difference also highlights the need to strengthen standardized training and guideline-based practices in other pediatric units. Overall, the findings indicate that nurses working in pediatric units in Al-Hilla possess a moderate level of knowledge regarding pain management, with notable areas for improvement particularly in nursing care and pain assessment. These results point to the necessity of implementing regular and structured training programs in children's hospitals, promoting the routine use of pain assessment tools, developing unit-based protocols, and strengthening monitoring and evaluation components of nursing interventions (Ellis *et al*., 2007; Dowden *et al*., 2008; Sharon & Czarnecki, 2021).

This study has certain limitations, including reliance on self-reported data and inclusion of nurses working only in hospitals in the city of Al-Hilla, which limits the generalizability of the findings. In addition, the cross-sectional design does not allow for the establishment of cause-and-effect relationships. These limitations should be taken into account when interpreting the results.

5. CONCLUSIONS AND RECOMMENDATIONS

This study demonstrated that the knowledge levels of nurses working in children's hospitals in Al-Hilla regarding pain management in children were generally moderate. However, notable areas requiring improvement were identified, particularly in nursing care for children experiencing pain and in pain assessment processes. Although nurses demonstrated relatively higher levels of knowledge regarding pharmacological and non-pharmacological interventions, this knowledge was not sufficiently translated into systematic nursing care and clinical decision-making. The association between knowledge level, educational attainment, and the clinical unit in which nurses worked indicates that pediatric pain management is influenced not only by individual knowledge but also by institutional structure, clinical experience, and unit-based learning opportunities. In particular, the higher knowledge scores observed among nurses working in pediatric emergency, neonatal, and pediatric intensive care units underscore the importance of clinical experience gained in these settings.

Based on these findings, it is recommended that regular and structured in-service training programs be implemented for nurses working in children's hospitals. Training content should address not only pharmacological treatment but also the effective use of pain assessment tools, non-pharmacological interventions, and the planning, implementation, and monitoring of nursing care. In addition, the development of standardized pain assessment and management protocols within pediatric units and their integration into routine clinical practice are recommended. Future research should focus on evaluating the impact of educational interventions on nurses' knowledge levels and clinical practices, exploring nurses' perceptions and experiences related to pain management through qualitative approaches, and conducting multicenter studies across different regions. Such research may contribute to strengthening nursing care in pediatric pain management and ensuring that children receive safer, more effective, and more comprehensive care.

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