

Original Research

Evaluation of Pediatric Delirium in Saudi Arabian PICUs: A Comprehensive Assessment of Awareness and Management

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Received (first version): 08-Sep-2024

Accepted: 12-Nov -2024

Published online: 28-Aug-2025

Abstract

Background: Pediatric delirium, a neuropsychiatric disorder, affects up to 66% of critically ill children, disrupting cerebral functioning. Often misdiagnosed or confused with other conditions, delirium remains a challenge in pediatric care. **Objectives:** to evaluate the awareness, practices, and management strategies for pediatric delirium in Saudi Arabia among healthcare professionals working in pediatric intensive care units (PICUs). **Method:** A cross-sectional study assessed pediatric delirium awareness and management among physicians practicing in PICUs across various healthcare facilities in Saudi Arabia. The study spanned from December 2023 to February 2024 and included physicians with expertise in pediatric delirium. Utilizing a validated tool, data analysis was performed using SPSS version 24[®]. Statistical analyses included chi-square and Fisher exact tests for categorical variables with two groups and One-Way ANOVA for those with more than two groups. A p-value of less than 0.05 was deemed statistically significant. **Results:** Ninety-eight participants responded to the emailed questionnaire (response rate: 61.25%). Most were PICU consultants (53.1%) working in government hospitals (85.7%). Uncertainty prevailed regarding delirium prevalence in their units (53.1%), with hyperactive delirium being the most reported type (31.6%). Preventive measures included maintaining a regular sleep-wake cycle (85.7%), modifying contributing factors (75.5%), and optimizing sedation goals (75.5%). The primary assessment tool was the Cornell Assessment of Pediatric Delirium (CAP-D). Supportive treatment (60.2%), non-pharmacological interventions (58.2%), and benzodiazepines (41.8%) were common preventive measures. A statistically significant association was found between professional qualification and recognition of delirium-mistaken conditions (p-value=0.001). PICUs with at least one consultant (p-value=0.023) and a nurse-to-patient ratio of 1:1 (p-value= <0.001) had significantly higher awareness, while single-patient rooms showed greater awareness compared to multiple-patient occupancy settings (p-value= 0.009) among healthcare professionals. **Conclusion:** The study identified inadequate knowledge of delirium and assessment in PICUs, underscores the importance of enhancing consultants' knowledge working in these units, and considers the side effects of pharmacological interventions. Modifiable factors and non-pharmacological management should be encouraged to achieve an optimal outcome of pediatric delirium.

Keywords: pediatric delirium; awareness; management; intensive care unit; healthcare professionals; Saudi Arabia

INTRODUCTION

Delirium is an acute brain dysfunction marked by disruptions in attention, consciousness, cognitive functions, thinking, and sleep-wake cycles¹. Delirium commonly manifests in the elderly population with cognitive impairment in intensive care units (ICUs). However, recent findings show its prevalence in

a considerable number of critically ill children, particularly those up to five years of age². At the time of admission, the prevalence of delirium in pediatric patients ranges from 10% to 66%, with higher rates in post-operative patients and those receiving mechanical ventilation, reaching up to 80%³⁻⁹.

The higher trend of pediatric delirium significantly impacts hospital outcomes, leading to increased length of hospital stay, duration of mechanical ventilation, higher medical costs, and mortality². Studies have shown that delirious children tend to have more extended hospital stays (~14 days vs ~6 days), an increased number of days in the ICU (60%), and a fourfold increase in the duration of mechanical ventilation^{4,5,7,10}. Consequently, this results in a substantial increase in medical costs, nearly four times higher costs¹¹, and a fourfold increased risk of mortality among delirious children^{7,12}.

Various risk factors that contribute to pediatric delirium include the child's underlying medical illness, iatrogenic factors, and the hospital environment¹³. These factors often trigger pediatric delirium, highlighting the importance of a multidimensional strategy that targets and helps in the early detection of the underlying cause¹⁴, as detecting the underlying trigger promptly can aid in reversing delirium¹⁵. However, the early detection of delirium presents a crucial opportunity for healthcare professionals to identify children at risk and mitigate the associated adverse outcomes¹⁶⁻¹⁹.

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Guidelines recommend routinely screening critically ill children using various validated questionnaires in ICUs. However, there is a concerning gap in delirium awareness and screening practices among healthcare professionals, resulting in pediatric delirium being underdiagnosed and treated in ICUs²⁰⁻²³. Studies have reported that only one-third of the children with significant symptoms are diagnosed and treated due to inadequate screening in ICUs^{3,24}.

In ICUs, delirium is a significant concern among children, resulting in higher healthcare costs and subsequent mortality due to increased length of hospital stay. Therefore, this issue necessitates a holistic approach to managing delirium by enhancing awareness and adherence to the management guidelines among healthcare professionals in ICUs. In Saudi Arabia, studies assessing pediatric delirium awareness and management among healthcare professionals in ICUs are scarce. Therefore, this study aimed to evaluate the level of awareness among healthcare professionals in PICUs and the existing practices and management strategies for pediatric delirium in Saudi Arabia to identify the potential areas for improvement where interventions may be required to enhance pediatric delirium care in PICUs.

METHODS

Study designs

A cross-sectional study was conducted from December 2023 to February 2024 to evaluate pediatric delirium awareness and management among physicians working in PICUs of different healthcare settings in the Kingdom of Saudi Arabia.

Participants' inclusion/exclusion criteria

The participants will be physicians responsible for PICUs in the Kingdom of Saudi Arabia. The inclusion criteria comprised physicians working in PICUs and understanding pediatric delirium. The study did not include physicians who did not meet the above criteria.

Study tool

A validated questionnaire²⁵ was used to evaluate pediatric delirium awareness and management among physicians working in PICUs. The survey included sections that had the characteristics of participants, a section that explored knowledge about delirium (prevalence, its type, diagnostic criteria, and prevention strategies), and a third section that related to approaches for the management of delirium. The characteristic features of the participating units were assessed through 13 inquiries. At the same time, the knowledge about delirium was gauged through 5 questions, and four additional questions were focused on gathering information regarding delirium management.

Study Procedure

The study questionnaire link was sent online, i.e., through emails, using a reliable and secure survey platform to physicians working in PICUs of different hospitals in the Kingdom of Saudi Arabia. Participation in this study was voluntary, and

the purpose of conducting this study was explained to the participants in an email. Adequate time was provided to the participants to complete the questionnaire, and reminders were sent after two-week intervals to maximize response rates. All participants' responses were anonymous and were not tracked for individual participants.

Ethical Considerations

The relevant Institutional Review Board (KFMC, PNU) obtained ethics approval for this study. All the study procedures complied with the IRB standards and the Helsinki Declaration of 1975.

Sample size

No formal sample size calculation was performed for this study; however, a random, convenient sampling technique was used.

Statistical analysis

We analyzed data using SPSS version 24*. The descriptive data was presented as frequencies and percentages. The chi-square and Fisher exact tests were used to compare the categorical data of the two groups. However, we applied a statistical test such as One-Way ANOVA for categorical data with more than two groups. A p-value of less than 0.05 was considered statistically significant.

RESULTS

A total of 160 participants were approached by sending the link to the study questionnaire to them through emails; out of 160 participants, only 98 participants filled out the questionnaire, with a response rate of 61.25%. Among 98 participants, the majority of them (85.7%) were working in Government hospitals; regarding their professional qualifications and designation, the majority (53.1%) were PICU consultants, followed by Assistant consultants/Specialists (26.5%). Most PICUs have at least one consultant consistently available (91.8%), while fewer have part-time consultants (23.5%). Regarding the average number of beds, most units have 11 or more beds (69.4%). Over half of the units (53.1%) provide fellowship training. The nurse-to-patient ratios vary among the units; the majority (52.0%) have a nurse per patient. Regarding bed layouts, single patient rooms (83.7%) predominated compared to multiple occupancy rooms and noise pollution detection practices, with the intermittent measurement being the least standard method (9.2%). The techniques to maintain a good sleep-wake cycle include bedside night lights (33.7%) followed by eye masks (17.3%). The frequency of receiving relatives of patients varies, with the most common approach being according to the need at certain intervals during the day (51.0%) [as shown in Table 1].

Table 2 illustrates delirium awareness, including PICUs' prevalence, types, diagnosis, and prevention measures. The prevalence of delirium: the majority of the participants indicated uncertainty (53.1%) about the prevalence, followed by $\leq 5\%$ prevalence (20.4%). Different types of delirium observed include hyperactive (31.6%), followed by hypoactive (22.4%), and (27.6%) with mixed type. Conditions that can be confused with delirium showed that iatrogenic withdrawal syndrome



Table 1: Characteristics of the PICUs that participated in the study (n=98)		
	Frequency	Percentage
"What is your PICU level?"		
Secondary level	87	88.8
Tertiary level	11	11.2
"What is the feature of the hospital where the PICU is located?"		
Government Hospital	84	85.7
University Hospital	10	10.2
Semi-government Hospital	4	4.1
"What is the healthcare professional and qualification?"		
PICU Consultant	52	53.1
Assistant Consultant/Specialist	26	26.5
PICU Fellow	14	14.3
Nurse	2	2
PICU Registrar	1	1
Resident PEDIATRIC ICU	2	2
Pediatrician	1	1
"Is there at least one consultant constantly in your PICU?"		
Yes	90	91.8
No	8	8.2
"Is there a part-time consultant in your PICU?"		
No	75	76.5
Yes	23	23.5
"What is the average number of beds in your PICU?"		
<6	3	3.1
6–10	27	27.6
≥ 11	68	69.4
"Does your PICU provide fellowship training?"		
Yes	52	53.1
No	46	46.9
"What is the number of nurses per patient in your PICU?"		
01:01	51	52
02:01	39	39.8
03:01	6	6.1
04:01	2	2
"How is the bed layout in your PICU?"		
Single patient rooms	82	83.7
Multiple occupancy rooms	16	16.3
"How is noise pollution detected in your PICU?"		
No measurement	63	64.3
Continuous measuring device (color visual) available	26	26.5
Intermittent measurement is done	9	9.2
"What is/are the method(s) used to maintain a good sleep-wake cycle in your PICU?"		
Bedside night light	33	33.7
Eye masks	17	17.3
Quran recitation	11	11.2

Initiate medications	6	6.1
None	31	31.6
“How often can you receive the relatives of patients in your PICU?”		
Continuously in the appropriate patient	22	22.4
According to the need, at certain intervals during the day	50	51
Receiving only during the family visit time	25	25.5
Never	1	1

Table 2: Awareness of delirium among participants (n=98)		
	Frequency	Percentage
“What is the prevalence of delirium in PICUs?”		
≤ 5	20	20.4
5–10	10	10.2
10–20	7	7.1
20–30	6	6.1
30–40	3	3.1
I don’t know	52	53.1
“What type of delirium have you seen so far in your PICU?”		
Hyperactive	31	31.6
Hypoactive	22	22.4
Mixed type	27	27.6
None	4	4.1
I don’t know	14	14.3
“What are the conditions that can be confused with delirium?”		
Iatrogenic withdrawal syndrome	62	63.3
Under sedation	24	24.5
Pain	9	9.2
All	2	2
None	1	1
“What methods can be used in the diagnosis of delirium?”		
Assessment tools	52	53.1
Clinically	39	39.8
Based on the response to the treatment	7	7.1
“In your opinion, which of the following measures can be applied to prevent the development of delirium in PICUs?” *		
Maintaining a normal sleep-wake cycle	84	85.7
Modifying factors that contribute to the development of delirium	74	75.5
Optimizing sedation goals	74	75.5
Reducing noise pollution by the use of noise measuring devices	71	72.4
Using dim light at night	71	72.4
Staying with the child’s loved one	60	61.2
Encouraging early physical therapy	57	58.2
Improve metabolic disturbances (especially electrolytes)	41	41.8
Using eye patch	38	38.8
Use dexmedetomidine infusion	35	35.7
Using an earpiece	27	27.6

Correcting anemia, transfusing if necessary	23	23.5
Setting an oxygen saturation target of 95% and above	16	16.3
Use benzodiazepine infusion	9	9.2
Use anticholinergic	3	3.1
Reducing immobilization	2	2
Starting benzodiazepine infusion or increasing the current dose	1	1
Avoiding anticholinergic use	1	1

* Participants selected multiple responses, so the percentage cannot be 100%

was the most common (63.3%), followed by undersedation (24.5%). Clinical assessment (39.8%) and assessment tools (53.1%) were the most commonly reported methods for diagnosing delirium. A mixed opinion was reported regarding the measures for preventing delirium, such as maintaining a regular sleep-wake cycle (85.7%) followed by modifying

contributing factors (75.5%) and optimizing sedation goals (75.5%) [as shown in Table 2].

Table 3 illustrates the evaluation of delirium management regarding who conducts delirium assessments; PICU Physicians are the most common assessors (58.2%), followed by nurses

Table 3: Evaluation of delirium management		
	Frequency	Percentage
"Who conducts delirium assessments in your PICU?"		
PICU Physician	57	58.2
Nurse	40	40.8
Child psychiatrist	8	8.2
Pediatrician	2	2
Clinical Pharmacist	1	1
None	28	28.6
"How often are delirium evaluations performed in your PICU?"		
At least once per shift	24	24.5
Once each day	6	6.1
Rarely patient based	3	3.1
Patient-based	47	48
Never	18	18.4
"What assessment tools do you use for delirium evaluation in your PICU?"		
The Cornell Assessment of Pediatric Delirium (CAP-D)	29	29.6
The Pediatric Confusion Assessment Method (pCAM)	13	13.3
Withdrawal assessment tool	2	2
The Delirium Rating Scale	1	1
Not being used	53	54.1
"Which of the following measures do you implement to prevent the development of delirium in your PICU?" *		
Non-pharmacological interventions	57	58.2
Supportive treatment	59	60.2
Benzodiazepines	41	41.8
Haloperidol	22	22.4
Quetiapine	18	18.4
Melatonin	14	14.3
Atypical antipsychotics	10	10.2
Risperidone	2	2
Clonidine	1	1

* Participants selected multiple responses, so the percentage cannot be 100%



(40.8%), while “how often are delirium evaluations performed in your PICU,” approximately half of the respondents reporting patient-based evaluations (48.0%), while 24.5% perform assessments at least once per shift. For the assessment tools used for the evaluation of delirium, the most common was the CAP-D (29.6%), followed by the pCAM (13.3%). Regarding the measure implanted for the prevention of delirium, the most common measure was supportive treatment (60.2%), followed by non-pharmacological interventions (58.2%) and benzodiazepines (41.8%) [as shown in Table 3]. The association between delirium awareness and unit characteristics revealed a statistically significant finding. Specifically, a statistically significant association existed between professional qualification and recognizing conditions mistaken for delirium (p -value=0.001). This suggests that PICU Consultants exhibited higher awareness of conditions that can be confused with delirium than others. Moreover, PICUs with at least one consultant (p -value=0.023) and a nurse-to-patient ratio of 1:1 demonstrated statistically significantly higher awareness levels as compared to their counterparts (p -value=<0.001). Additionally, there was a statistically significant difference in delirium awareness concerning diagnostic methods and bed layout within PICUs. Single-patient rooms were associated with greater understanding than multiple-patient occupancy settings (p -value= 0.009).

The interventions utilized for reducing delirium prevalence and the unit characteristics did not exhibit any significant association concerning the utilization of benzodiazepine, dexmedetomidine, and anticholinergic drugs. Similarly, no statistically significant relationship was observed between the unit's bed layout and the PICU's methods to maintain a healthy sleep-wake cycle (p -value= 0.363). Likewise, no statistically significant difference was found between using eye patches and the unit's bed layout (p -value= 0.659) and between those who detect noise (p -value= 0.558). Additionally, there was no significant association between the initiation of physical therapy and the knowledge of treating anemia with those who detect noise (p -value= 0.669) and (p -value=0.230), respectively.

DISCUSSION

Previous literature has reported a high prevalence of pediatric delirium in PICUs²⁵⁻²⁹. Despite the higher prevalence of pediatric delirium, the assessment is often neglected, and this can exert an additional burden on mortality^{7,12,30}. Pediatric delirium, a neuropsychiatric disorder, disrupts cerebral functioning, affecting up to 66% of critically ill children³¹. It is well known that delirium significantly prolongs the hospital stay, increases medical expenses, and increases the risk of mortality^{32,33}. However, studies examining pediatric delirium awareness and management in PICUs among healthcare professionals are scarce; none of the studies has examined pediatric delirium in the Kingdom of Saudi Arabia. Therefore, we believe this study will fill this massive gap in the existing literature by assessing pediatric delirium awareness and management by healthcare professionals in the PICU in the Kingdom of Saudi Arabia.

The literature suggests a high prevalence of pediatric delirium,

with a meta-analysis indicating a pooled prevalence of 34%. A specific study reported a delirium prevalence of 25%, but this figure rose to 38% for hospital stays exceeding 6 days⁷. Environmental factors^{2,17} may contribute to the rise in delirium occurrences during extended hospital stays. The hospital environment often disrupts sleep, heightening the risk of delirium². Pediatric delirium encompasses hyperactive, hypoactive, and mixed types³⁴. Recent findings from a meta-analysis indicate that hypoactive delirium is the most common subtype, with an overall pooled prevalence ranging from 46% to 81%³³. Individual studies have reported varying prevalences, with hypoactive delirium at 46%, followed by mixed delirium at 45%⁷, and another study reporting 48% hypoactive and 40% mixed type³⁵. In our study, most participants reported a delirium prevalence in the PICU of up to 10%, which is lower than previous literature. One possible explanation for this lower prevalence observed in our study is that nearly half of the participants were unaware of the prevalence in their units. Another potential reason could be negligence in assessment, as well as confusion between delirium symptoms and other conditions such as iatrogenic withdrawal syndrome and under-sedation. Moreover, the evaluation of delirium in our study was deemed inadequate. Concerning the subtype of delirium, most cases were classified as hyperactive delirium, followed by mixed delirium, presenting both hyperactive and hypoactive features, contrasting with findings in previously published literature. However, a study conducted in Turkey documented a higher prevalence of hyperactive delirium at 73.7%, followed by hypoactive delirium²⁵.

The recognized gold standard for diagnosing delirium in pediatric patients, as indicated in the literature, is the Diagnostic and Statistical Manual-V (DSM-V) criteria, typically applied by a psychiatrist^{14,15}. However, there is significant variability among clinicians when diagnosing pediatric delirium¹⁶. The DSM-5 lacks specific criteria for pediatric delirium to address developmental discrepancies. Instead, clinicians must evaluate whether patients' responses align with their environment, medication regimen, developmental stage, and expected regression due to illness. Effective identification and treatment of delirium require collaborative efforts among healthcare professionals such as nurses, pediatricians, pediatric intensivists, child psychiatrists, and other specialists in pediatric mental health. However, conducting assessments by child psychiatrists across all centers at any given time presents significant challenges. Consequently, bedside assessment tools have been devised for non-psychiatrists to screen for delirium in seriously ill children regularly. To do so, different tools that can be used to assess delirium in critically ill children have become available: the CAP-D^{36,37,38}, pCAM³⁹, and the preschool CAM-ICU (psCAM-ICU)⁴⁰. Each tool possesses its strengths and limitations. The strength of (CAP-D) is that it is a strictly observational screening tool used in children of all ages. It is adapted from the PAED to better identify hypoactive and hyperactive delirium by using a behavioral scale; however, CAP-D and psychiatric evaluations needed to be done at least twice daily, once by each shift nurse³⁸. In our study, the CAP-D emerged as the most frequently utilized tool for delirium assessment, followed by



the pCAM. However, the literature highlights a limitation of the pCAM: it cannot be applied to children under the age of 5, and due to the fluctuating nature of delirium throughout the day, it may not detect early occurrences during nursing shifts²⁵. The prevalent use of these assessment tools in our study mirrors findings from prior research on delirium assessment [37, 38]. Nearly half of the patients in our study were reportedly not assessed using any tool, emphasizing a concern about oversight that could potentially increase the rate of patient mortality and contribute to prolonged hospital stays.

In our study, units with at least one consultant showed higher awareness of delirium (p -value=0.023), and there was a statistically significant increase in awareness among units with a nurse-to-patient ratio of 1:1 compared to others (p -value=<0.001). Interestingly, our findings diverge somewhat from a study conducted in Turkey, where participants demonstrated significantly high knowledge regarding the clinical and assessment tools for diagnosing delirium despite a nurse-to-patient ratio of 2:1²⁵. Moreover, in our study, there was a statistically significant difference in delirium awareness concerning the methods used for diagnosis and the bed layout in the PICU. Units with single patient rooms exhibited higher awareness than those with multiple patient occupancy (p -value= 0.009). Our study findings align with another study's findings²⁵. Because of the limited available literature on awareness concerning nurse-to-patient ratios, we couldn't conduct extensive comparisons in this regard. However, decreasing the nurse-to-patient ratio to 1:1 is recommended by assigning a single nurse to care for each patient⁴¹. As delirium results from multifactorial etiology and due to its fluctuating course, delirium remains under-detected and misdiagnosed in healthcare settings⁴².

Targeted education for healthcare professionals has significantly enhanced the awareness and detection of delirium^{43,44}. The complexity of delirium assessment and treatment in pediatric cases is compounded by its confusion with other conditions. Limited awareness of delirium can be perplexing and may result in detection errors. According to the European Society of Pediatric and Neonatal Intensive Care (ESPNIC), distinguishing among pain, distress, inadequate sedation, withdrawal syndrome, and delirium can pose challenges⁴⁵. In our study, the relationship between delirium awareness parameters and unit features showed a statistically significant association between the professional qualification and the conditions confused with delirium (p -value=0.001); this showed that the awareness of delirium-confusing conditions was higher in PICU Consultants than others. Our study findings are aligned with the study of other findings of a similar nature²⁵. Targeted education for healthcare professionals has been demonstrated to significantly enhance the awareness and detection of delirium, leading to improved delirium management^{43,44}.

Management of pediatric delirium is challenging, and it can be achieved by pharmacological and non-pharmacological interventions^{14,33,46}. Enhancing the management of delirium in pediatric patients involves identifying and modifying environmental or other factors that contribute

to its development. Increased knowledge, self-confidence, and positive attitudes toward delirium assessment and management among healthcare professionals have been linked to shorter times for diagnosing delirium and ensuring prompt intervention^{24,47}. Management of pediatric delirium typically involves addressing underlying medical conditions, optimizing the PICU environment, and minimizing iatrogenic triggers^{14,48}. Non-pharmacological interventions are predominantly utilized in treating delirium in the majority of cases⁴⁹. However, despite lacking approval from the United States Food and Drug Administration for such treatment and lacking licensure for use in children, typical or atypical antipsychotics are often employed as pharmacological interventions for delirium. Antipsychotics such as haloperidol, olanzapine, risperidone, and quetiapine are frequently utilized as initial pharmacological treatments⁵⁰. Additionally, dexmedetomidine, melatonin, and magnesium sulfate have been used for delirium in adults and children⁵¹⁻⁵³. While pharmacological interventions have yielded positive outcomes, they are also associated with reported side effects^{50,54,55}. Recent studies indicate that non-pharmacological interventions are more effective than antipsychotics in critically ill children⁵⁶. To manage delirium with non-pharmacological interventions, non-pharmacological management includes modifying environmental factors by reducing noise, reducing the use of bright lights, and reducing unpleasant smells in PICUs⁵⁷. Additionally, the presence of a loved one and physical activity benefit pediatrics with delirium^{25,58}. Our study findings support that non-pharmacological activities were most commonly employed to manage delirium. At the same time, pharmacological interventions were utilized in our study in case the non-pharmacological failed and the chances of pharmacological management were high. Among the pharmacological management in our research, the use of benzodiazepine was very high. Still, the literature reported that benzodiazepines are the mainstay of pediatric sedation, and a causal and temporal relationship was demonstrated between benzodiazepine exposure and delirium development^{59,60}. The LiberAction project urges the reduction and limited use of benzodiazepines⁴⁹. Overall, our study findings reveal inadequate awareness of pediatric delirium, with a majority of participants lacking knowledge about its prevalence in their units and often confusing it with other conditions, resulting in undetected cases in PICUs. Moreover, the assessment of delirium in PICUs raises concerns about instances of non-assessment, which can potentially lead to prolonged hospital stays and increased mortality rates. To address delirium in PICUs, initial consideration should be given to non-pharmacological management and environmental modifications. If these approaches fail to yield positive outcomes, pharmacological options may be necessary, accompanied by a robust mechanism for detecting associated side effects.

Strength and Limitation

The strength of this study is that it is the first of its kind to evaluate the knowledge and management practices of delirium in PICUs across multiple centers (including both secondary and tertiary units) in the Kingdom of Saudi Arabia. The findings



of this study highlight the status of knowledge and practice in the PICUs, which further emphasizes the development of continuous medical education and educational programs to uplift the knowledge of healthcare professionals. The possible limitation is that the findings of this study may not be generalizable to all secondary and tertiary PICUs in the Kingdom of Saudi Arabia. Large multicentered studies should be conducted to better understand the knowledge and practices for managing pediatric delirium.

CONCLUSION

Considering the multifactorial etiology and confusion as challenges in detecting delirium in PICUs with other conditions, the study underscores the importance of enhancing the knowledge of consultants working in these units. Additionally, modifiable factors and non-pharmacological management should be encouraged to achieve an optimal outcome of pediatric delirium. Implementing continuous educational activities and knowledge-sharing initiatives focused on

assessing, diagnosing, and managing pediatric delirium should be prioritized.

AUTHOR CONTRIBUTIONS

Conceptualization: AA; Methodology: FA; Software: MK; Validation: MK; Formal analysis: MK; Investigation: MA; Resources: MA; Data curation: MN; Writing—original draft preparation: MK; Writing—review and editing: AA; Project administration: FA

CONFLICT OF INTEREST

The authors declare that they have no competing interests.

ACKNOWLEDGMENT

Princess Nourah bint Abdulrahman University Researchers Supporting Project number (PNURSP2024R487), Princess Nourah bint Abdulrahman University, Riyadh, Saudi Arabia.

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