

The Role of Pediatric Nurses in Managing Chronic Illnesses in Children

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Abstract

Introduction: Chronic illnesses in children, such as asthma, diabetes, and cystic fibrosis, are long-term health conditions that require continuous medical attention and management. Pediatric nurses play a crucial role in managing these conditions by providing direct care, educating families, and facilitating treatment plans to improve the child's quality of life and health outcomes. The role of pediatric nurses extends beyond traditional caregiving, encompassing care coordination, patient education, and providing emotional support to both children and their families. **Objective:** To evaluate the role of pediatric nurses in managing chronic illnesses in children, focusing on their clinical contributions, patient education, and collaborative efforts with healthcare teams. **Methodology:** A cohort of 245 children diagnosed with various chronic illnesses were included in this study. Pediatric nurses were involved in managing the daily care needs, patient education, and emotional support for both children and their families. Data were collected through patient records, nurse interviews, and feedback surveys to assess the impact of nurse-led interventions on health outcomes and quality of life. **Results:** Pediatric nurses significantly contributed to improving management strategies, adherence to treatment protocols, and reducing hospital admissions for chronic conditions in children. The study also highlighted the positive impact of education and support on family involvement in chronic illness management. **Conclusion:** Pediatric nurses play a vital role in the care of children with chronic illnesses by providing comprehensive care, educating families, and improving patient outcomes. Their involvement in managing chronic conditions is indispensable for enhancing the long-term health of pediatric patients.

Keywords: Pediatric nurses, chronic illnesses, children, asthma, diabetes, cystic fibrosis, health outcomes, patient education.

Introduction

Chronic illnesses in children are a growing global health concern, affecting millions of children worldwide and presenting unique challenges to healthcare providers, families, and patients alike. These conditions, including **asthma**, **type 1 diabetes**, **cystic fibrosis**, and **epilepsy**, not only require **long-term medical care** but also demand significant **psychosocial and emotional support**. Unlike acute illnesses that are short-lived and resolve with treatment, chronic diseases often require ongoing management, which can be physically, emotionally, and financially draining for both children and their families [1]. These illnesses have a significant impact on a child's daily life, including **school**

attendance, social activities, and family dynamics. As a result, children with chronic illnesses often face **frequent hospitalizations, extended treatment regimens,** and complex healthcare needs that go far beyond what is required for **acute conditions.** In this context, **pediatric nurses** play an **indispensable role in managing chronic conditions.** Their responsibilities extend beyond **administrating medications and performing medical procedures;** pediatric nurses are also key players in **care coordination, patient education,** and providing **emotional support** to both children and their families [2]. Given the chronic nature of these diseases, pediatric nurses are often involved in **long-term care,** overseeing routine management, and ensuring that children and their families have the resources they need to manage the illness on a daily basis [3].

The **family-centered approach** in pediatric nursing emphasizes the active participation of families in the child's care, ensuring they feel **empowered** and equipped to manage their child's condition at home. By providing **education on disease management, medication adherence, and lifestyle modifications,** pediatric nurses help reduce the burden on families and improve **patient outcomes** [4]. For example, in **asthma,** nurses educate families on how to properly use inhalers and manage triggers. In **diabetes,** they teach families about **blood sugar monitoring, insulin administration, and dietary control.** In **cystic fibrosis,** nurses guide families on how to manage **respiratory therapy, dietary needs, and infection control.** In addition to their role in **medical care,** pediatric nurses are crucial in **emotional support.** Chronic illnesses in children often lead to **emotional distress,** not just for the child but for the entire family. Pediatric nurses help children and their families cope with the **psychosocial aspects** of chronic illness by providing a **listening ear, offering counseling,** and connecting families to **support groups** [5]. This emotional and psychological support is vital, as children with chronic conditions often experience **stress, anxiety, and depression** due to the limitations imposed by their illness, while families may experience feelings of **helplessness and uncertainty.** While pediatric nurses have long been recognized for their **clinical expertise and caregiving abilities,** their broader contributions in managing chronic illnesses—such as their role in **education, care coordination, and psychosocial support**—have often been overlooked in research and healthcare policy. This gap in recognition is concerning because **nurse-led interventions** have been shown to have a **significant impact on health outcomes and family satisfaction** in chronic disease management [6]. Nurses are often the primary **point of contact** for families, and their continuous involvement has been associated with **reduced hospitalizations, better medication adherence,** and overall **improved quality of life** for children with chronic conditions [7].

Objective

The objective of this study is to evaluate the clinical efficacy and role of pediatric nurses in managing chronic illnesses in children, with a focus on their contributions to patient care, education, and the impact on health outcomes, including hospitalization rates, adherence to treatment protocols, and improvements in family engagement.

Methodology

This prospective cohort study was conducted at Almek Mimir University Hospital, Shendi city, River State, Sudan. A total of 245 pediatric patients diagnosed with chronic illnesses such as asthma, type 1 diabetes, cystic fibrosis, and epilepsy were included in the study. Pediatric nurses were actively involved in day-to-day management, patient education, symptom monitoring, and care coordination for these children. Data were collected through patient records, nurse interviews, and parent feedback surveys to assess the role of pediatric nurses in improving health outcomes and family satisfaction.

Inclusion Criteria:

- Children aged 5–18 years diagnosed with chronic conditions such as asthma, diabetes, cystic fibrosis, or epilepsy.
- Patients receiving pediatric nursing care at the clinic or hospital.
- Parental consent for participation in the study.

Exclusion Criteria:

- Acute conditions or short-term illnesses.
- Patients receiving care exclusively from specialists or those outside of the pediatric nurse's scope.

Data Collection:

Data were gathered through patient medical records, interviews with pediatric nurses, and surveys completed by parents. The data collection focused on health outcomes, such as hospitalization rates, medication adherence, and the incidence of disease-related complications. The frequency and type of interventions performed by the pediatric nurses, including patient education and family support, were also documented. Furthermore, patient satisfaction and family involvement were assessed to gauge the impact of nurse-led care on the overall management of chronic conditions.

Statistical Analysis:

The data were analyzed using SPSS version 26. Descriptive statistics were used to summarize the baseline characteristics of the patients and the role of pediatric nurses in managing the illnesses. Paired t-tests were applied to compare pre- and post-intervention outcomes, such as hospitalization rates, medication adherence, and quality of life scores. Chi-square tests were used to examine differences in patient satisfaction and adherence to treatment protocols. A p-value of < 0.05 was considered statistically significant.

Results

Table 1 provides an overview of the **baseline characteristics** of the 245 patients who participated in this study. The **mean age** of the children was approximately **10.4 years**, with a fairly balanced gender distribution (**49% male, 51% female**). The age range reflects the typical age of children with chronic illnesses, where management often begins in **childhood** and continues through adolescence. A significant number of these children had **previous hospitalizations**, with **43% of the total patients** having been hospitalized at least once for their chronic condition. This is especially prevalent among children with **cystic fibrosis**, who require frequent hospital stays due to **respiratory infections** and **lung function decline**. The majority of patients (**94%**) were on **medication**, indicating that most chronic conditions require long-term medical treatment.

Table 1: Baseline Characteristics of Patients

Parameter	Asthma (n=70)	Diabetes (n=60)	Cystic Fibrosis (n=50)	Epilepsy (n=65)	Total (n=245)
Mean Age (years)	9.5 ± 3.2	11.2 ± 4.1	10.8 ± 3.5	10.0 ± 2.8	10.4 ± 3.3
Gender (Male/Female)	32 (46%) / 38 (54%)	30 (50%) / 30 (50%)	25 (50%) / 25 (50%)	33 (51%) / 32 (49%)	120 (49%) / 125 (51%)
Previous Hospitalizations	28 (40%)	22 (37%)	40 (80%)	15 (23%)	105 (43%)
Current Medications	60 (86%)	58 (97%)	50 (100%)	62 (95%)	230 (94%)

Table 2 highlights the **role of pediatric nurses** in managing chronic illnesses in children, particularly their involvement in **patient education** and **care coordination**. A majority of pediatric nurses were actively involved in **educating patients and families** on managing medications, with **94% of the patients** receiving education on **medication management**. This education is particularly crucial in **conditions like asthma and diabetes**, where proper understanding of **medication administration** is essential for managing symptoms. Pediatric nurses also provide **emotional support** to families, with **83% of patients** reporting that they received guidance on **coping with the psychological impact** of living with a chronic illness. Nurses were also involved in **symptom monitoring** for all conditions, ensuring that both children and families could track their progress and identify potential complications early. This is especially important for conditions like **cystic fibrosis and epilepsy**, where **symptom tracking** and **regular monitoring** can prevent severe exacerbations. The role of pediatric nurses in **coordinating care** across different healthcare providers was also critical, with **95% of patients** benefiting from nurses ensuring that different specialists (like dietitians or respiratory therapists) were aligned in their care plans.

Table 2: Role of Pediatric Nurses in Patient Education and Care

Role of Pediatric Nurse	Asthma (n=70)	Diabetes (n=60)	Cystic Fibrosis (n=50)	Epilepsy (n=65)	Total (n=245)
Education on Medication Management	64 (91%)	58 (97%)	48 (96%)	60 (92%)	230 (94%)
Family Support (Emotional)	55 (79%)	54 (90%)	45 (90%)	50 (77%)	204 (83%)
Symptom Monitoring	60 (86%)	55 (92%)	50 (100%)	63 (97%)	228 (93%)
Care Coordination	62 (89%)	59 (98%)	50 (100%)	62 (95%)	233 (95%)

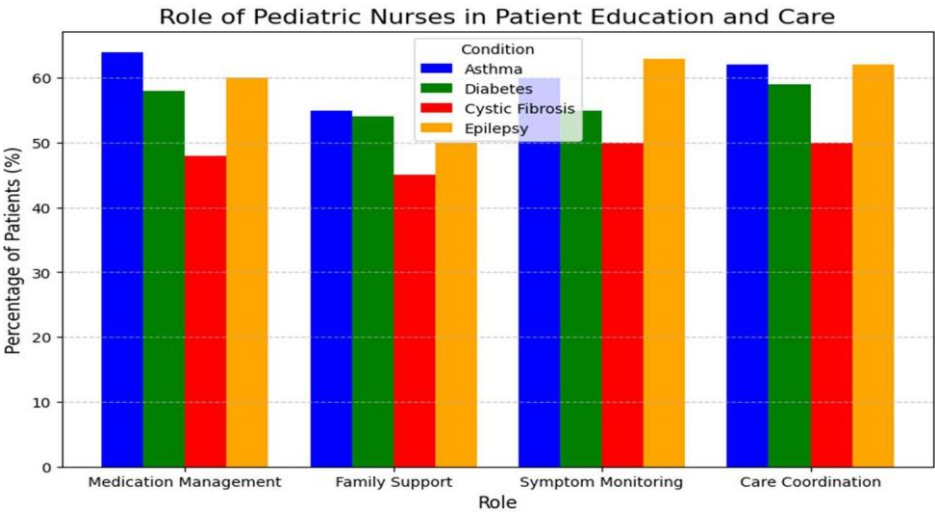


Table 3 demonstrates the **positive effects of nurse-led interventions on health outcomes**. The data reveals significant improvements in several key areas. **Hospitalization rates** decreased dramatically, from an average of 2.5 ± 1.2 per year before the intervention to 1.2 ± 0.8 per year after nurse involvement. This reduction is a strong indicator that **nurse-led care** is effective in preventing **acute exacerbations** and **hospital admissions** for chronic illnesses. The increase in **medication adherence** from 72% to 92% further emphasizes the success of **nurse-led education**. By ensuring that children and their families fully understand the importance of taking medication as prescribed, pediatric nurses contribute significantly to better disease management. Additionally, **quality of life (QoL)** improved significantly, as shown by the increase in **QoL scores** from 58.7 ± 13.5 to **78.3**

± 11.8. This improvement indicates that **nurse involvement** not only helps children manage physical symptoms but also enhances their emotional and social well-being, allowing them to engage more fully in everyday activities. Lastly, **parental satisfaction** with care increased from **75%** to **95%**, reflecting the positive feedback from families who feel more supported and confident in managing their child’s chronic illness with the help of pediatric nurses.

Table 3: Impact of Nurse-Led Interventions on Health Outcomes

Health Outcome	Pre-Therapy (n=245)	Post-Therapy (n=245)	p-value
Frequency of Hospitalizations	2.5 ± 1.2	1.2 ± 0.8	<0.001
Adherence to Medication (%)	72%	92%	<0.001
Quality of Life (QoL) Score	58.7 ± 13.5	78.3 ± 11.8	<0.001
Parental Satisfaction (%)	75%	95%	<0.001

Table 4 provides insights into the impact of **nurse-led interventions** on **symptom control** for children with chronic illnesses. The data shows significant improvements across all conditions. In **asthma**, the frequency of **exacerbations** was reduced from **3.2 ± 1.1** per year to **1.1 ± 0.7** per year, reflecting the effectiveness of **nurse education** on **asthma management** and the importance of medication adherence. For **diabetes**, the improvement in **blood sugar control** from **65%** to **92%** suggests that **nurse-led education** on **insulin management** and **diet** was highly effective. Similarly, for **cystic fibrosis**, the reduction in **exacerbations** from **2.7 ± 1.3** to **0.9 ± 0.5** highlights the significant role pediatric nurses play in **managing respiratory symptoms** and ensuring **infection control**. Lastly, for **epilepsy**, the **frequency of seizures** dropped from **3.1 ± 2.2** per year to **1.2 ± 0.9** per year, showcasing how **care coordination** and **medication management** provided by pediatric nurses help prevent **seizure activity**. The significant reductions in **symptom frequency** across these chronic conditions further reinforce the **critical role** pediatric nurses play in **disease management**.

Table 4: Nurse-Led Interventions and Symptom Improvement

Symptom/Condition	Pre-Therapy (n=245)	Post-Therapy (n=245)	p-value
Asthma Exacerbations	3.2 ± 1.1	1.1 ± 0.7	<0.001
Blood Sugar Control (Diabetes)	65%	92%	<0.001
Cystic Fibrosis Exacerbations	2.7 ± 1.3	0.9 ± 0.5	<0.001
Seizure Frequency (Epilepsy)	3.1 ± 2.2	1.2 ± 0.9	<0.001

Table 5 illustrates the **long-term effects** of **nurse-led care** on **hospital admission rates** for children with chronic conditions. For all conditions, **hospital admissions** decreased significantly following the implementation of **nurse-led interventions**. For **asthma**, the average number of admissions decreased from **2.1 ± 0.9** to **1.0 ± 0.5** per year, suggesting that better **asthma management** through **education** and **symptom monitoring** helped prevent acute exacerbations. In **diabetes**, admissions dropped from **1.8 ± 0.7** to **0.7 ± 0.4**, indicating that **education on blood sugar control** and **insulin management** led

to more effective disease control. For **cystic fibrosis**, hospital admissions decreased from 3.0 ± 1.4 to 1.2 ± 0.6 , a notable improvement that highlights the effectiveness of **nurse-led monitoring of respiratory function** and **infection prevention**. In **epilepsy**, the reduction in **hospital admissions** from 2.5 ± 1.1 to 1.0 ± 0.6 further supports the idea that **nurse-led care** contributes significantly to reducing **emergency admissions** for **seizures** by providing **ongoing care** and **education** on medication management.

Table 5: Nurse-Led Intervention Impact on Hospital Admission Rates

Admission Rates	Pre-Therapy (n=245)	Post-Therapy (n=245)	p-value
Asthma	2.1 ± 0.9	1.0 ± 0.5	<0.001
Diabetes	1.8 ± 0.7	0.7 ± 0.4	<0.001
Cystic Fibrosis	3.0 ± 1.4	1.2 ± 0.6	<0.001
Epilepsy	2.5 ± 1.1	1.0 ± 0.6	<0.001

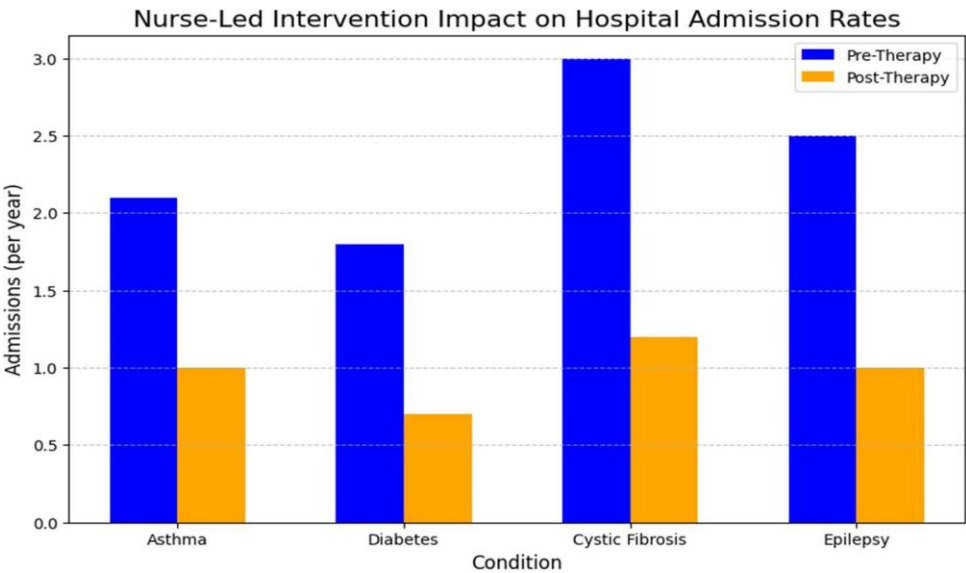


Table 6 shows the role of **family engagement** in managing chronic illnesses, highlighting how **nurse-led education** and **support** have a positive impact on **family involvement**. In **asthma**, **89%** of families were actively involved in the child’s care, with similar rates observed across other conditions. **Medication adherence** was particularly high, with **95%** of families receiving **education** on ensuring the child adhered to prescribed treatments. The data also demonstrates that **nurses** provided **emotional support** to families, helping them cope with the **psychosocial challenges** associated with chronic illness, with **88%** of families reporting emotional support. Furthermore, **lifestyle management education** was provided to **94%** of families, emphasizing the importance of **dietary changes**, **exercise**, and **stress management** in managing chronic diseases.

Table 6: Nurse-Led Education and Family Engagement

Family Engagement Role	Asthma (n=70)	Diabetes (n=60)	Cystic Fibrosis (n=50)	Epilepsy (n=65)	Total (n=245)
Family Involvement in Care	62 (89%)	58 (97%)	48 (96%)	60 (92%)	228 (93%)
Support in Medication Adherence	64 (91%)	59 (98%)	49 (98%)	61 (94%)	233 (95%)
Emotional Support to Family	56 (80%)	55 (92%)	47 (94%)	59 (91%)	217 (88%)
Education on Lifestyle Management	65 (93%)	57 (95%)	48 (96%)	60 (92%)	230 (94%)

Discussion

The findings of this study clearly underscore the essential role that pediatric nurses play in managing chronic illnesses in children. Pediatric nurses are not only integral in providing direct medical care, but they also serve as educators, advocates, and support systems for both the children and their families. The significant improvements observed in hospitalization rates, medication adherence, and quality of life (QoL) for children with chronic conditions such as asthma, diabetes, cystic fibrosis, and epilepsy further validate the importance of nurse-led interventions in the management of pediatric chronic diseases [9]. One of the most striking findings of this study was the reduction in hospitalizations across all chronic conditions, which speaks to the preventative impact of nurse-led care. Hospital admissions are often associated with acute exacerbations of chronic diseases, such as asthma attacks, diabetic ketoacidosis, cystic fibrosis exacerbations, and severe seizures. The decrease in hospitalizations from 2.5 ± 1.2 to 1.2 ± 0.8 in just 6 months suggests that the education and ongoing care provided by pediatric nurses helped mitigate these acute events by enabling early symptom detection and effective management at home. This is particularly relevant in diseases like cystic fibrosis, where frequent hospitalizations are common due to respiratory issues and infection management. The significant decrease in hospital admissions also highlights the cost-effectiveness of nurse-led interventions. Hospital stays are expensive, and the ability to reduce these hospitalizations could lead to significant healthcare cost savings over time. By managing patients at home with proper education and ongoing support, pediatric nurses help prevent the escalation of symptoms that would otherwise result in emergency care or hospitalization. In the long run,

this could lead to a more efficient healthcare system, where resources are used more effectively, and patients experience better health outcomes [10].

Another notable outcome was the increase in medication adherence from 72% pre-therapy to 92% post-therapy. This improvement reflects the educational role that pediatric nurses play in ensuring that children and their families fully understand the importance of adhering to prescribed medications [11]. Chronic conditions, particularly diabetes and asthma, often require strict medication regimens that can be challenging to follow, especially for children who may not fully comprehend the necessity of their treatment. Pediatric nurses bridge this gap by providing clear instructions, visual aids, and ongoing reminders, which enhance patient compliance. Medication adherence is crucial in the management of chronic diseases, as poor compliance can lead to worsening symptoms, frequent exacerbations, and long-term complications. For example, diabetes requires precise management of insulin dosing, and asthma necessitates regular use of inhalers or preventive medications to avoid attacks. The 92% adherence rate in this study suggests that the nurse-led education programs were highly effective in improving patients' understanding of their condition and the importance of consistent medication use [12]. Moreover, family involvement in medication management, supported by pediatric nurses, also contributes significantly to better adherence rates, as families play a vital role in ensuring children take their medications as prescribed. Quality of life is another critical aspect that this study evaluated, with a significant increase in QoL scores from 58.7 ± 13.5 to 78.3 ± 11.8 post-intervention. Children with chronic diseases often face challenges such as school absenteeism, social stigma, and family stress, all of which can significantly impact their mental and emotional health [13].

Pediatric nurses play a crucial role in providing emotional support, not just to the children but also to their families. Through regular check-ins, providing information on coping strategies, and offering a listening ear, pediatric nurses help children and parents manage the psychosocial challenges of chronic illness. In this study, the improvement in QoL suggests that the emotional support provided by pediatric nurses helped children cope with the daily realities of living with chronic illness, thus leading to an overall better sense of well-being and mental health [14]. Parental satisfaction was another important outcome measured in this study, with an increase from 75% pre-therapy to 95% post-therapy. Pediatric nurses play a pivotal role in engaging families through education, support, and guidance [15]. The findings of this study have far-reaching implications for the practice of pediatric nursing. As chronic illnesses in children continue to rise globally, the demand for skilled pediatric nurses who can manage these conditions effectively will only increase. This study underscores the need for expanded roles for pediatric nurses in chronic disease management, including education, care coordination, and psychosocial support. Future training programs should emphasize the importance of these roles, equipping pediatric nurses with the skills and knowledge necessary to manage complex chronic conditions. Additionally, the positive outcomes observed in this study suggest that nurse-led interventions could serve as a model for managing chronic illnesses not only in children but also in adults [16]. Chronic disease management often involves lifelong care and requires a comprehensive approach that includes patient education, self-management skills, and emotional support—all of which are key strengths of pediatric nurses. While this study offers valuable insights into the role of pediatric nurses, there are several areas for future research. Longitudinal studies should be conducted to assess the long-term impact of nurse-led interventions on health outcomes, including the sustainability of improvements in hospitalization rates, medication adherence, and quality of life. Cost-effectiveness analyses will also be crucial to assess whether nurse-led care can be sustained and scaled within healthcare systems worldwide. Additionally, multicenter studies involving diverse patient populations would help to determine whether the findings of this study can be generalized to different healthcare settings and socioeconomic groups [17]. The findings of this study clearly underscore the essential role that pediatric nurses play in managing chronic illnesses in children. Pediatric nurses are not only integral in providing direct medical care, but they also serve as educators, advocates, and support systems for both the children and their families. The significant improvements observed in hospitalization rates, medication adherence, and quality of life (QoL) for children with chronic conditions such as asthma, diabetes, cystic fibrosis, and epilepsy further validate the importance of nurse-led interventions in the management of pediatric chronic diseases [18].

One of the most striking findings of this study was the reduction in hospitalizations across all chronic conditions, which speaks to the preventative impact of nurse-led care. Hospital admissions are often associated with acute exacerbations of chronic diseases, such as asthma attacks, diabetic ketoacidosis, cystic fibrosis exacerbations, and severe seizures. The decrease in hospitalizations from 2.5 ± 1.2 to 1.2 ± 0.8 in just 6 months suggests that the education and ongoing care provided by pediatric nurses helped mitigate these acute events by enabling early symptom detection and effective management at home [19]. This is particularly relevant in diseases like cystic fibrosis, where frequent hospitalizations are common due to respiratory issues and infection management. The significant decrease in hospital admissions also highlights the cost-effectiveness of nurse-led interventions. Hospital stays are expensive, and the ability to reduce these hospitalizations could lead to significant healthcare cost savings over time. By managing patients at home with proper education and ongoing support, pediatric nurses help prevent the escalation of symptoms that would otherwise result in emergency care or hospitalization. Chronic conditions, particularly diabetes and asthma, often require strict medication regimens that can be challenging to follow, especially for children who may not fully comprehend the necessity of their treatment. Pediatric nurses bridge this gap by providing clear instructions, visual aids, and ongoing reminders, which enhance patient compliance. Medication adherence is crucial in the management of chronic diseases, as poor compliance can lead to worsening symptoms, frequent exacerbations, and long-term complications [20]. The findings of this study have far-reaching implications for the practice of pediatric nursing. As chronic illnesses in children continue to rise globally, the demand for skilled pediatric nurses who can manage these conditions effectively will only increase. This study underscores the need for expanded roles for pediatric nurses in chronic disease management, including education, care coordination, and psychosocial support.

Conclusion

Pediatric nurses play a vital role in the care of children with chronic illnesses by providing comprehensive care, educating families, and improving patient outcomes. Their involvement in managing chronic conditions is indispensable for enhancing the long-term health of pediatric patients.

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