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Effectiveness Of Educational Guidelines On Nurses' Performance Regarding Nephrotic Syndrome Care Of Pediatric Patients At District Hospital

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ABSTRACT

Objective: To assess nurses' knowledge and practices about the care of nephrotic syndrome among pediatric population

Material and Methods: A quasi-experimental study design was utilized to assess the knowledge and practice of nurses about nephrotic syndrome.The population was staff nurses present at the District Health Quarter, Hospital. The calculated sample size is too small to perform the statistical test with good efficacy. After adding 20% dropout rate the sample size was 50.

Results: Nurses showed a fairly strong understanding of nephrotic syndrome, with most correct answers falling between 62% and 84%. The topic they answered most accurately was recognizing edema as a common symptom in children, with 84% getting it right. However, fewer nurses (only 62%) correctly identified the importance of a low-sodium diet, highlighting an area where more education may be needed.Knowledge and practices before and after the intervention periods differed significantly ($t>1.945$, $P<0.05$).

Conclusion: The results unequivocally show that planned training programs greatly improve nurses' clinical practices and understanding of juvenile nephrotic syndrome. Better support for impacted families, early detection of difficulties, as well as more effective treatment are all possible outcomes of these advancements. Sustaining high-quality juvenile nephrotic syndrome treatment requires ongoing training and focused teaching, particularly in areas like nutrition and long-term follow-up

Keywords: *Nephrotic Syndrome Care, Educational Guidelines, Pediatric Patients*

1. INTRODUCTION

Nephrotic syndrome (NS) is a commonly diagnosed kidney disease in childhood. It is a condition in which the kidneys "leak" protein from blood into urine. In children, nephrotic syndrome may only be temporary, or it may be an early sign of kidney damage (Rodriguez- Ballestas & Reid-Adam, 2022). The resistant forms may progress to chronic kidney disease and/or end stage renal disease. Nephrotic syndrome occurs when changes in the selectivity barrier of the glomerular capillary wall can no longer restrict the loss of protein to a minimal level, thus resulting in massive protein loss through the urine (Rodriguez-Ballestas & Reid- Adam, 2022).

Nephrotic Syndrome is a clinical state that includes massive proteinuria , hypoalbuminemia , hyperlipidemia , and edema .The disorder can occur as first, primary disease known as idiopathic nephrosis , childhood nephrosis or minimal change nephrotic syndrome (MCNS) , second ,a secondary disorder that occurs as clinical manifestation after or in association with glomerular damage (Vivarelli et al., 2023) . Third, congenital form inherited as an autosomal recessive disorder. The disorder is characterized by increased glomerular permeability to plasma protein, which results in massive urinary protein loss. The glomerulus is responsible for the initial step in the formation of urine , and the filtration rate depends on an intact glomerular membrane (Vivarelli et al., 2023).

Furthermore, nephrotic syndrome occurs in children in three forms congenital , secondary who are related to systemic diseases such as sickle cell anemia or systemic lupus erythematous (SLE) (Tamura, 2021) and primary form it is also found

in three types according to the damage of the membrane, which include minimal change nephrotic syndrome (MCNS) focal glomerular sclerosis (FGS) and membrane proliferative glomerulonephritis (MPGN) , The last two types respectively have poor responses to steroid- therapy (2).Minimal change nephrotic syndrome (MCNS) the most common type of the NS, it is seen in (80%) of cases, which affects males more than females by 2:1 ratio (3). It affects 16 in 100,000 children worldwide year (Tsuji et al., 2021; Zheng et al., 2021).

The clinical manifestation related to nephrotic syndrome includes child begins to gain weight, which progresses over a period of days or weeks. Puffiness of the face, especially around the eyes, is apparent on arising in the morning but subsides during the day, when swelling of the abdomen, genitalia, and lower extremities is more prominent (Lebel et al., 2020). Generalized edema (anasarca) may develop gradually or rapidly. Edema of the intestinal mucosa may cause diarrhea, loss of appetite, and poor intestinal absorption (Chen et al., 2021; Tamura, 2021).

The first line treatment for primary nephrotic syndrome is steroid therapy; it may be started without kidney biopsy if child has classic attributes of Nephrotic Syndrome. Ultimately majority of children will attain remission (absence of albumin in urine of early morning samples), but 80% experiences relapse during the course of treatment (Hahn et al., 2020). Upper respiratory tract infection caused by virus has been identified for more than fifty percent of relapses. Urinary tract infections are also responsible for relapse along with inadequate reaction to treatment (Sachdeva et al., 2021; Trautmann et al., 2023). Though steroid therapy has reduced mortality, but on another side they leave various side effects on children such as Cushing disease, increase in weight, growth suppression, and elevated blood pressure, alteration in the metabolism of glucose, emotional distress and behavior changes(Cheong, 2020; Vivarelli et al., 2023).

The chief complication of nephrotic syndrome is infection, followed by thromboembolic events. Hypertension, hyperlipidemia, features corticosteroid toxicity and behavioral disorders are less frequent(C. Wang et al., 2023). Treatment for nephrotic syndrome include specific treatment and nonspecific treatment. Specific treatment focuses on the underlying causes of the condition, while nonspecific treatment includes corticosteroid, immunosuppressive, antihypertensive, diuretic medications and antibiotics for infections. Supportive treatment may also include diet, high in protein and fiber but low in saturated fat and salts (Banerjee et al., 2024; Sachdeva et al., 2021).

Nursing consideration is very important for establishing a basic lines of care and family education, which includes: first, monitoring intake and output in young children and weighing the diapers, second, assessment of edema through observing swelling around eyes and dependent area, third, diet should be restricted like salt and fluids and high protein during appearance of edema and fourth protected the child with nephrotic syndrome from infection especially when the child is receiving corticosteroid therapy (Banerjee et al., 2024; Hamed Tawfique et al., 2023) Nurses have a major role in teach child and family to report immediately any changes in sensation, warmth, comfort or appearance (color, activity and edema). They also may teach family how to monitor blood values for white blood count, initiate strategies to prevent infection by use aseptic technique, assess child urinary output, fluid intake and make balance between them to prevent hypervolemia, hematuria, to assess proteinuria, to prevent thrombosis, assess the program of treatment or diuretic therapy, steroid therapy and immunization to prevent hypovolemic shock, hypertension, growth failure and iatrogenic (BRADY et al., 2023; Y. Wang et al., 2023) (Ishikura et al., 2014).A good nursing care helps child with nephrotic syndrome reduce sufferings and control illness condition effectively. It is an important part for patients to recover, so learning how to arrange a good nursing care is very important for parents who have child with nephrotic syndrome. Nurses must master knowledge about health and illness, think critically and creatively and participate in inter professional collaborations. Therefore, this study aimed to determine the effectiveness of educational guidelines on nurses' performance regarding nephrotic syndrome care in children.

The significance of educational guidelines on pediatric nurses' knowledge and practices about nephrotic syndrome is profound. Nephrotic syndrome, a kidney disorder common in children, requires meticulous management to prevent complications. A well-structured educational program enhances nurses' understanding of the syndrome, its pathophysiology, clinical manifestations, and appropriate nursing interventions. Improved knowledge translates to better clinical practices, ensuring early detection, accurate monitoring, and effective management of the condition. This leads to improved patient outcomes, reduced hospital stays, and overall better quality of care. Additionally, such programs empower nurses, fostering a sense of confidence and professional growth, which is crucial in delivering high-quality, evidence-based pediatric care. By improving the nurse's knowledge and practices, the program aims to reduce complications, optimize care strategies, and enhance the overall quality of life for affected children. Ultimately, this leads to better healthcare delivery and patient education.

RATIONALE : Nephrotic syndrome, a chronic kidney disorder, requires precise and informed nursing care to ensure effective management and improved patient outcomes. Conducting an interventional study on nurses' knowledge and practice regarding the care of nephrotic syndrome in Pakistan is crucial due to the significant impact of this condition on pediatric and adult patients alike. Nephrotic syndrome requires precise and consistent management to prevent complications and improve patient outcomes. However, there is often a gap in the specialized training and up-to-date knowledge among nursing staff in resource-limited settings like Pakistan. This study aims to assess current knowledge levels, identify gaps, and implement targeted educational interventions to enhance the competency and effectiveness of nurses. By improving the

quality of care through education, this study seeks to directly benefit pediatric patient health, reduce morbidity and mortality associated with nephrotic syndrome, and promote best practices within the healthcare system.

2. MATERIAL AND METHODS

A quasi-experimental study design was utilized to assess the knowledge and practice of nurses about nephrotic syndrome. The study participants were taken from inpatient department of District Health Quarter, Hospital, Vehari, and Punjab, Pakistan. The population was staff nurses present at the District Health Quarter, Hospital. The calculated sample size is too small to perform the statistical test with good efficacy. After adding 20% dropout rate the sample size was 50. The Study duration was 9 months after the approval of synopsis from IRB.

Inclusion Criteria

- Both male and female registered staff nurses
- Having age 23-45 years.
- Nurses who work at the in patients ward for more than six months
- Nurses who are involved in the direct care of children with the following criteria

- Preschool and school children diagnosed as nephrotic patient

- Free from any other disease

Exclusion Criteria

- The nurses working on contract and board created posts
- The head nurses and student nurses were excluded.
- Nurses on rotation were excluded.
- Nurses who already receive any education/workshop on nephrotic syndrome care in last 6 months.

3. RESEARCH TOOLS

The Self- administered questionnaire sheet (Pre/Post-Test) includes the following three parts.

Demographic characteristics

A self-administered tool designed by the researcher; it included the items related to socio- demographic characteristics of the pediatric nurses as age, gender, qualifications, years of general and pediatric experience, and whether they attended any training program regarding health care of Nephrotic Syndrome children.

Negotiation Knowledge Questionnaire:

The questionnaire developed by the researchers based on the review of the related literature to assess the nurse's knowledge about nephrotic syndrome in pediatric population. This questionnaire assess the understanding of the nurses about definition, sign and symptoms, causes, dietary management, complications of nephrotic syndrome, adverse drug reactions of corticosteroids and home care of nephrotic syndrome in children. A structured questionnaire consisted of 18 multiple choice questions. The questions were scored as "1" for correct answer, and "zero" for incorrect answer.

The total scores of nurses' knowledge is classified as follow:

- 70 % and more were considered good level of knowledge
- 60-to less than 70% were considered fair level of knowledge.
- Less than 60% were considered poor level of knowledge

Nephrotic Syndrome Nursing Practice Checklist

An adopted practice checklist was used to assess the nurses practice related to care provided to children with nephrotic syndrome. It includes Measuring vital signs ,intake and output, daily child weight, collect urine for 24 –hours, assessment child for edema, check urine for protein, obtaining blood sample for investigation, medication administration as order, provide psychological support for child and their families, prevent pressure sore by changing position, Infection control ,discharge plan and home care.

- 85 % and more were considered competent practices.
- Less than 85% was considered incompetent practice.

Educational program

The educational program was utilized standard guidelines about definition, sign and symptoms, causes, dietary management, complications of nephrotic syndrome, adverse drug reactions of corticosteroids and home care, measuring vital signs ,intake and output, daily child weight, collect urine for 24 –hours, assessment child for edema, check urine for protein, obtaining blood sample for investigation, medication administration as order, provide psychological support for child and their families, prevent pressure sore by changing position, Infection control ,discharge plan and home care to educate nurses about care of nephrotic children.

Tools validity and reliability

The tools were reviewed an expert panel of different nursing departments. The panel ascertained the face and content validity of the tools. The reliability was done by Cronbach's Alpha coefficient test which revealed that each of the two tools consisted of relatively homogenous items. Coefficient of reliability was measured by Cronbach's α (alpha). Cronbach alphas were calculated for the overall tested items of the studied nurses including total knowledge and total level of practice. Furthermore, a reliability test was conducted on the domains of the knowledge and practice. The reliability of knowledge scales exceeded the acceptable level (0.7 standards), while the reliability of each of practice scales exceeded the good level (0.8 standards).

4. RESULTS

Nephrotic syndrome (NS) is a common kidney condition in children, marked by the loss of protein in the urine due to increased permeability of the kidneys' filtering system. This leads to symptoms like swelling, fatigue, and weight gain (Rodriguez-Ballestas & Reid-Adam, 2022). The most frequent type in children is minimal change nephrotic syndrome (MCNS), which typically responds well to steroids, though relapses are common (Zotta et al., 2022). In more severe or treatment-resistant cases, NS can progress to chronic kidney disease or even kidney failure (Angeletti et al., 2023). Early diagnosis and consistent management are key to preventing long-term complications. In the treatment of NS among the children nurses play a central role in caring i.e., monitoring symptoms, managing treatment side effects, and supporting families through education. However, in countries like Pakistan, many nurses may lack the specialized knowledge and standardized practices that are needed for effective care due to limited training resources. Therefore, current study aims to assess whether educational guidelines can improve nurses' knowledge and practices, ultimately leading to better knowledge and practices regarding care of the children affected by nephrotic syndrome.

4.1. Demographic Analysis

Table 4.1

Constructs		Frequency	Percentage
Gender	Male	11	22.0
	Female	39	78.0
Job Type	Permanent	50	100.0
Marital Status	Married	24	48.0
	Single	26	52.0
Age Group	23-34 Years	24	48.0
	35-45 Years	26	52.0
Qualification	Nursing Diploma	23	46.0
	Specialty	16	32.0
	Masters	11	22.0
Job Position	Charge Nurse	50	100.0
DHQ Location	Lahore	14	28.0
	Multan	11	22.0
	Sahiwal	6	12.0
	Bahawalpur	11	22.0
	Faisalabad	8	16.0

Department	PediatricMedical and Nephrology	50	100.0
Experience	1-3 Years	18	36.0
	4-6 Years	17	34.0
	7-10 Years	8	16.0
	Above 10 Years	7	14.0

In the above Table 4.1, demographic details of the current study's participants have provided. The results showed that 39 (78%) of the 50 participants were female and remaining 11 (22%) were male, indicating that women comprise the great majority. All participants in the current study were permanently employed in the role of staff nurse. Regarding marital status, 26 nurses (52%) were married, while 24 (48%) were single. Participants were drawn from various districts, with 14 nurses (28%) from Lahore DHQ, 11 (22%) from both Multan and Bahawalpur, 8 (16%) from Faisalabad, and 6 (12%) from Sahiwal. In terms of age, the majority of respondents (52%) fell within the 35–45 year range, while the remaining 48% were between 23 and 34 years old. Educational qualifications revealed that 23 nurses (46%) held a nursing diploma, 16 (32%) had specialized training, and 11 (22%) had completed a master's degree. In terms of professional experience, 18 nurses (36%) had 1– 3 years of experience, 17 (34%) had 4–6 years, 8 (16%) had 7–10 years, and the remaining 7 (14%) had over a decade of experience.

4.2. Pre-Interventional Descriptive Analysis

4.2.1. Nurses Knowledge about Nephrotic Syndrome Table 4.2

Sr. No.	Questions	Correct		Incorrect	
		Freq.	%age	Freq.	%age
1	Which of the following best describes nephrotic syndrome? A condition characterized by high blood pressure and kidney stones **A kidney disorder marked by excessive protein loss in urine, low blood protein levels, high cholesterol levels,**	19	38.0	31	62.0
	and swelling.) A chronic kidney disease resulting in the complete loss of kidney function) An acute infection of the kidneys causing severe pain and Fever				
2	Which of the following is the most common cause of nephrotic syndrome in children? **a) Minimal change disease** b) IgA nephropathy c) Membranous nephropathy d) Focal segmental glomerulosclerosis	20	40.0	30	60.0
3	Which of the following medications can cause secondary nephrotic syndrome in children? a) Ibuprofen b) Penicillin **c) Cyclosporine** d) Vitamin C	20	40.0	30	60.0

4	Which of the following is a common sign of pediatric nephrotic syndrome? a) Hypertension **b) Edema** c) Jaundice d) Bradycardia	20	40.0	30	60.0
5	Which symptom is often first noticed by parents in children with nephrotic syndrome? a) Severe abdominal pain **b) Facial puffiness** c) Skin rash d) Coughing	18	36.0	32	64.0
6	Which of the following laboratory findings is typically elevated in nephrotic syndrome? a) Serum albumin **b) Serum cholesterol** c) Serum sodium d) Serum potassium	18	36.0	32	64.0
7	Which test is most important for confirming a diagnosis of nephrotic syndrome? a) Blood culture **b) Urinalysis** c) Chest X-ray d) Electrocardiogram (ECG)	20	40.0	30	60.0
8	What key finding in the urine indicates nephrotic syndrome? a) Presence of white blood cells **b) High levels of protein** c) Presence of glucose d) Presence of ketones	22	44.0	28	56.0
9	Which of the following blood tests is essential in the workup of nephrotic syndrome? a) Complete blood count (CBC) **b) Serum albumin level** c) Blood urea nitrogen (BUN)	19	38.0	31	62.0
	d) Serum amylase				
10	Which dietary restriction is often recommended for children with nephrotic syndrome? a) Low-protein diet b) Low-fat diet **c) Low-sodium diet** d) High-calcium diet	21	42.0	29	58.0

11	Which nutrient should be monitored and possibly supplemented in a child with nephrotic syndrome? a) Vitamin D b) Iron c) Calcium **d) All of the above**	23	46.0	27	54.0
12	Which of the following is a potential complication of untreated nephrotic syndrome? a) Hyperglycemia **b) Thrombosis** c) Diarrhea d) Hypothyroidism	20	40.0	30	60.0
13	**What is a common infection-related complication in children with nephrotic syndrome?** a) Pneumonia **b) Peritonitis** c) Meningitis d) Encephalitis	23	46.0	27	54.0
14	Which of the following is a common adverse effect of prolonged corticosteroid use? a) Hypotension b) **Growth retardation** c) Hyperpigmentation d) Alopecia	23	46.0	27	54.0
15	Prolonged corticosteroid therapy increases the risk of which condition? a) Type 1 diabetes **b) Osteoporosis** c) Hyperkalemia d) Scurvy	19	38.0	31	62.0
16	**Which of the following is an important aspect of home care for a child with nephrotic syndrome?** a) Encouraging high salt intake **b) Monitoring daily weight** c) Skipping medication doses occasionally d) Avoiding all physical activity	20	40.0	30	60.0
17	**Why is regular follow-up important for children with nephrotic syndrome?** a) To reduce medication costs b) **To monitor for disease relapse and manage complications** c) To prevent the need for a balanced diet d) To reduce the frequency of blood tests	21	42.0	29	58.0

18	**Parents should be educated to contact their healthcare provider immediately if their child with nephrotic syndrome experiences:** a) Increased thirst b) **Sudden weight gain** c) Mild headache d) Occasional cough	21	42.0	29	58.0

Table 4.2 show the respondents' knowledge regarding nephrotic syndrome. The responses of 50 nurses in the current study regarding 18 questions on the knowledge based questions are discussed in the following:

1. Definition of Nephrotic Syndrome

Only 38% of participants were able to correctly identify nephrotic syndrome as a kidney condition characterized by excessive protein loss in the urine, low levels of blood protein, high cholesterol, and swelling. The fact that 62% chose incorrect answers suggests that many participants had a limited understanding of what the condition actually involves.

2. Common Cause in Children

Only 40% of participants correctly identified minimal change disease as the most common cause of nephrotic syndrome in children. The remaining 60% selected other options, indicating that many were unfamiliar with the leading cause of this condition in the pediatric population.

3. Drug-Induced Nephrotic Syndrome

When participants were asked to identify a medication that could lead to secondary nephrotic syndrome, only 40% correctly chose Ibuprofen. This means that a significant 60% were not aware that certain commonly used drugs can affect kidney function in children, highlighting a gap in understanding drug-related risks.

4. Common Sign in Children

Similarly, just 40% of respondents correctly recognized edema (swelling), a common symptom of nephrotic syndrome in children. It appears that many participants were unfamiliar with the fundamental clinical indications of the disease, as seen by the fact that 60% of them missed this.

5. First Noticed Symptom by Parents

Facial puffiness was recognized by just 36% of participants as the initial observable sign of nephrotic syndrome in children, making this question one of the least accurate. This implies that the majority of participants are not skilled at identifying the condition's early symptoms.

6. Laboratory Finding in Nephrotic Syndrome

Just like the previous question, only 36% of participants knew that serum cholesterol levels are typically elevated in nephrotic syndrome. This low score highlights a limited understanding of the condition's biochemical profile.

7. Most Important Diagnostic Test

According to 40% of respondents, urinalysis is the most crucial diagnostic test. Nonetheless, the fact that 60% of respondents provided inaccurate responses indicates that a large number of participants are not aware with the fundamental procedures involved in nephrotic syndrome diagnosis.

8. Key Urine Finding

This question received the highest correct response rate, with 44% recognizing proteinuria (high levels of protein in urine) as a hallmark of nephrotic syndrome. While this is a relatively better result, more than half of the participants still answered incorrectly, indicating room for improvement.

9. Essential Blood Test

Serum albumin is a crucial test for nephrotic syndrome, however only 38% of respondents correctly recognized it. The remaining 60% were unable to connect hypoalbuminemia, or low albumin levels, with the illness, indicating a lack of knowledge of test results and their meaning.

10. Dietary Restriction

42% of respondents chose a low-sodium diet when asked about dietary management, indicating a little greater understanding of dietary guidelines. However, the majority of participants lacked a thorough understanding of this care component.

11. Nutrient Monitoring

This question had the highest success rate overall, with 46% of participants correctly identifying that vitamin D, iron, and calcium may need to be monitored or supplemented. This suggests a relatively stronger awareness of nutritional concerns in managing nephrotic syndrome.

12. Complication of Untreated Nephrotic Syndrome

About 40% of participants understood that thrombosis can be a complication of untreated nephrotic syndrome, reflecting moderate awareness of its potential risks, though a majority still lacked this knowledge.

13. Infection-Related Complication

One of the better-answered questions was this one, as 46% of respondents correctly identified peritonitis as a potential consequence. This suggests a somewhat improved comprehension of the hazards of infection in youngsters with impaired immune systems.

14. Adverse Effect of Corticosteroids

Again, 46% answered correctly, recognizing growth retardation as a side effect of long-term corticosteroid use. While this shows moderate knowledge of treatment risks, more than half of the participants still missed the mark.

15. Risk from Prolonged Steroid Use

Only 38% were aware that osteoporosis is a potential risk associated with prolonged steroid use. This suggests that many participants were unfamiliar with the long-term side effects of steroid therapy.

16. Home Care Practice

When it came to home care, 40% knew that monitoring daily weight is an important activity for children with nephrotic syndrome. While this shows some level of awareness, it also indicates that many participants need further guidance on effective home management strategies.

17. Importance of Regular Follow-Up

Slightly better results were seen here, with 42% recognizing that regular follow-ups are necessary to monitor for relapse and manage complications. Still, the fact that more than half got it wrong suggests the importance of reinforcing this message.

18. When to Seek Medical Help

Finally, 42% correctly identified sudden weight gain as a sign that requires immediate medical attention. This shows a relatively better understanding of red flag symptoms, though the majority still lacked clarity on when to seek urgent care.

According to the current study, most participants lacked knowledge in several important areas, underscoring the need for focused educational interventions, even though there were pockets of reasonable comprehension, particularly regarding treatment side effects, complications, and nutrition.

4.2.2. Nurses Nephrotic Syndrome Practices Table 4.3

Sr. No.	Questions	Done		Not Done	
		Freq.	%Age	Freq.	%Age
Initial Assessment					
1	Obtain patient history (e.g., onset of symptoms, previous episodes)	19	38.0	31	62.0
2	Conduct physical examination (e.g., edema, blood pressure, weight)	18	36.0	32	64.0
3	Monitor vital signs	20	40.0	30	60.0
4	Assess urine output and characteristics (e.g., proteinuria)	17	34.0	33	66.0
Ongoing Monitoring					
5	Regularly monitor and document vital signs	22	44.0	28	56.0
6	Track daily weight to assess fluid retention or loss	21	42.0	29	58.0
7	Measure and record abdominal girth	20	40.0	30	60.0
8	Monitor intake and output	19	38.0	31	62.0

Medication Management					
9	Administer corticosteroids as prescribed	20	40.0	30	60.0
10	Administer diuretics if prescribed	18	36.0	32	64.0
11	Provide antihypertensive medications if needed	16	32.0	34	68.0
12	Monitor for side effects of medications	20	40.0	30	60.0
Nutrition and Fluid Management					
13	Educate on low-sodium diet	20	40.0	30	60.0
14	Encourage adequate protein intake	17	34.0	33	66.0
15	Monitor for signs of malnutrition	19	38.0	31	62.0
16	Educate on fluid restrictions if necessary	21	42.0	29	58.0
17	Monitor for signs of dehydration or fluid overload	14	28.0	36	72.0
Patient and Family Education					
18	Educate on the disease process of nephrotic syndrome	20	40.0	30	60.0
19	Instruct on recognizing signs of relapse or complications	18	36.0	32	64.0
20	Teach medication administration and adherence	17	34.0	33	66.0
21	Provide dietary and fluid management guidance	18	36.0	32	64.0

Table 4.3 describes the behaviors of nurses in connection to pediatric Nephrotic syndrome. The procedures group activities into five categories: initial evaluation, pharmaceutical therapy, nutrition/fluid management, patient/family education, and ongoing monitoring. Considerable differences in adherence to best practices are shown by the data; some places exhibit good compliance, while others show considerable gaps, which are covered in the sections that follow.

1. **Initial Assessment (Low Compliance)**

Less than half of the nurses (about 38%) took a thorough patient history, and only around 36% performed physical exams. Consequently, many opportunities to establish a baseline for each patient and find important early signs were missed. Furthermore, only 40% of nurses checked vital signs and urine output, two crucial procedures for diagnosing and managing nephrotic disease. This suggests that there was insufficient consistency and in the first examination.

2. **Ongoing Monitoring (Moderate Compliance)**

Although nurses performed somewhat better at tracking daily weight (42%), and taking regular vital signs (44%), these results are still below what is acceptable for providing quality patient care. Additionally, there was irregularity in the measurement of belly circumference (40%) and the tracking of fluid intake and outflow (38%), both of which are critical for identifying fluid accumulation. This can postpone taking prompt action to avoid issues like dehydration or edema.

3. **Medication Management (Suboptimal Adherence)**

Only about 40% of nurses consistently gave corticosteroids, and just 36% administered diuretics as prescribed. This inconsistency could affect how well the disease is managed. While monitoring for medication side effects was done somewhat regularly (40%), managing blood pressure with antihypertensive drugs was much less common (only 32%), which raises concerns about patients' risk of uncontrolled hypertension.

4. **Nutrition and Fluid Management (Significant Gaps)**

Although fluid limitations are crucial for controlling edema, only 42% of the patients were given advice on them, and less than half (approximately 40%) were educated about a low-sodium diet. Recovery may be slowed down since it was frequently neglected to check for malnutrition symptoms (38%) and determine if patients were receiving enough protein (34%). Monitoring for dehydration or fluid overload received the least attention (only 28%), which is alarming because these conditions can create major problems.

5. **Patient and Family Education (Inconsistent Delivery)**

Merely 40% of families received knowledge about the condition, and only 36% received instruction on how to spot recurrence symptoms. They find it more difficult to properly manage the disease at home as a result. Additionally, there was

little instruction on adhering to prescription regimens (34%) and providing appropriate food guidance (36%), which may eventually result in worse results.

Overall, the information demonstrates that nephrotic syndrome nursing care isn't always reliable. This emphasizes how crucial it is to fortify procedures, offer continuing education, and concentrate on quality enhancements in order to guarantee that patients receive the greatest treatment feasible.

4.5. Post-Interventional Descriptive Analysis

4.5.1. Nurses Knowledge about Nephrotic Syndrome Table 4.4

Sr. No.	Questions	Correct		Incorrect	
		Freq.	%age	Freq.	%age
1	Which of the following best describes nephrotic syndrome? a) A condition characterized by high blood pressure and kidnev stones **A kidney disorder marked by excessive protein loss in urine, low blood protein levels, high cholesterol levels, and swelling**. A chronic kidney disease resulting in the complete loss of kidney function An acute infection of the kidneys causing severe pain and fever	39	78	11	22
2	Which of the following is the most common cause of nephrotic syndrome in children? **a) Minimal change disease** b) IgA nephropathy c) Membranous nephropathy d) Focal segmental glomerulosclerosis	39	78	11	22
3	Which of the following medications can cause secondary nephrotic syndrome in children? a) Ibuprofen b) Penicillin **c) Cyclosporine** d) Vitamin C	35	70.0	15	30.0
4	Which of the following is a common sign of pediatric nephrotic syndrome? a) Hypertension **b) Edema** c) Jaundice d) Bradycardia	42	84.0	8	16.0
5	Which symptom is often first noticed by parents in children with nephrotic syndrome? a) Severe abdominal pain **b) Facial puffiness** c) Skin rash d) Coughing	37	74.0	13	26.0

6	Which of the following laboratory findings is typically elevated in nephrotic syndrome? a) Serum albumin **b) Serum cholesterol** c) Serum sodium d) Serum potassium	37	74.0	13	26.0
7	Which test is most important for confirming a diagnosis of nephrotic syndrome? a) Blood culture **b) Urinalysis** c) Chest X-ray d) Electrocardiogram (ECG)	38	76.0	12	24.0
8	What key finding in the urine indicates nephrotic syndrome? a) Presence of white blood cells **b) High levels of protein**	38	76.0	12	24.0
	c) Presence of glucose d) Presence of ketones				
9	Which of the following blood tests is essential in the workup of nephrotic syndrome? a) Complete blood count (CBC) **b) Serum albumin level** c) Blood urea nitrogen (BUN) d) Serum amylase	35	70.0	15	30.0
10	Which dietary restriction is often recommended for children with nephrotic syndrome? a) Low-protein diet b) Low-fat diet **c) Low-sodium diet** d) High-calcium diet	31	62.0	19	38.0
11	Which nutrient should be monitored and possibly supplemented in a child with nephrotic syndrome? a) Vitamin D b) Iron c) Calcium **d) All of the above**	34	68.0	16	32.0
12	Which of the following is a potential complication of untreated nephrotic syndrome? a) Hyperglycemia **b) Thrombosis** c) Diarrhea d) Hypothyroidism	34	68.0	16	32.0

13	**What is a common infection-related complication in children with nephrotic syndrome?** a) Pneumonia **b) Peritonitis** c) Meningitis d) Encephalitis	37	74.0	13	26.0
14	Which of the following is a common adverse effect of prolonged corticosteroid use? a) Hypotension b) **Growth retardation** c) Hyperpigmentation d) Alopecia	34	68.0	16	32.0
15	Prolonged corticosteroid therapy increases the risk of which condition? a) Type 1 diabetes **b) Osteoporosis** c) Hyperkalemia d) Scurvy	36	72.0	14	28.0
16	**Which of the following is an important aspect of home care for a child with nephrotic syndrome?** a) Encouraging high salt intake **b) Monitoring daily weight** c) Skipping medication doses occasionally d) Avoiding all physical activity	35	70.0	15	30.0
17	**Why is regular follow-up important for children with nephrotic syndrome?** a) To reduce medication costs b) **To monitor for disease relapse and manage complications** c) To prevent the need for a balanced diet d) To reduce the frequency of blood tests	32	64.0	18	36.0
18	**Parents should be educated to contact their healthcare provider immediately if their child with nephrotic syndrome experiences:** a) Increased thirst b) **Sudden weight gain** c) Mild headache d) Occasional cough	37	74.0	13	26.0

The nurses' reactions to the educational intervention about their understanding of pediatric nephrotic syndrome are explained in Table 4.4. A detailed discussion of their answers to the 18 questions is provided below:

1. **Overall Knowledge Level**

Nurses showed a fairly strong understanding of nephrotic syndrome, with most correct answers falling between 62% and 84%. The topic they answered most accurately was recognizing edema as a common symptom in children, with 84% getting

it right. However, fewer nurses (only 62%) correctly identified the importance of a low-sodium diet, highlighting an area where more education may be needed.

2. Basic Disease Understanding:

A large majority of nurses (78%) accurately understood what nephrotic syndrome is and also recognized Minimal Change Disease as the most common cause in children. This reflects a solid grasp of the basic concepts related to the condition

3. Clinical Features and Diagnosis:

Nurses demonstrated good awareness of the clinical signs of nephrotic syndrome. Most were able to correctly identify edema (84%) and facial puffiness (74%) as key symptoms, as well as recognize high serum cholesterol as a common lab finding (74%). In terms of diagnostics, the majority also knew that urinalysis and detecting protein in the urine (both at 76%) are essential for confirming the condition.

4. Medication and Complications:

Nurses showed a reasonable understanding of medications related to nephrotic syndrome, with 70% correctly identifying drugs that can contribute to the condition. Their awareness of complications was also fairly strong—many recognized side effects of corticosteroid use, such as growth retardation (68%) and osteoporosis (72%). In addition, a good number were aware of serious complications like peritonitis (74%) and thrombosis (68%), which are important for managing the condition effectively.

5. Home Care and Patient Education:

Nurses demonstrated a good grasp of key home care practices, with 70% recognizing the importance of monitoring daily weight and 64% understanding the need for regular follow-up visits to help manage relapses and complications. Most were also able to identify sudden weight gain (74%) as a warning sign that requires immediate medical attention.

6. Areas Needing Improvement:

Some gaps in knowledge were evident, particularly around dietary guidance, where only 62% of nurses correctly identified the need for a low-sodium diet. Additionally, just 64% recognized the importance of regular follow-up visits, pointing to a need for stronger emphasis on long-term care planning. Several other questions fell in the 68–70% range, showing a fair level of understanding but also clear room for improvement through targeted training.

The findings show that nurses generally have a moderate to good understanding of nephrotic syndrome, especially when it comes to recognizing symptoms, making a diagnosis, and being aware of common complications. However, there are still noticeable gaps in key areas like dietary management**,** awareness of medication side effects, and the importance of consistent follow-up care. These areas of weakness point to the need for focused training and education to better prepare nurses in delivering comprehensive care and supporting families more effectively.

5.2.2. Nurses Nephrotic Syndrome Practices Table 4.5

Sr. No.	Questions	Done		Not Done	
		Freq.	%Age	Freq.	%Age
Initial Assessment					
1	Obtain patient history (e.g., onset of symptoms, previous episodes)	38	76.0	12	24.0
2	Conduct physical examination (e.g., edema, blood pressure, weight)	35	70.0	15	30.0
3	Monitor vital signs	36	72.0	14	28.0
4	Assess urine output and characteristics (e.g., proteinuria)	41	82.0	9	18.0
Ongoing Monitoring					
5	Regularly monitor and document vital signs	42	84.0	8	16.0
6	Track daily weight to assess fluid retention or loss	41	82.0	9	18.0
7	Measure and record abdominal girth	38	76.0	12	24.0

8	Monitor intake and output	42	84.0	8	16.0
Medication Management					
9	Administer corticosteroids as prescribed	37	74.0	13	26.0
10	Administer diuretics if prescribed	38	76.0	12	24.0
11	Provide antihypertensive medications if needed	30	60.0	20	40.0
12	Monitor for side effects of medications	42	84.0	8	16.0
Nutrition and Fluid Management					
13	Educate on low-sodium diet	32	64.0	18	36.0
14	Encourage adequate protein intake	36	72.0	14	28.0
15	Monitor for signs of malnutrition	37	74.0	13	26.0
16	Educate on fluid restrictions if necessary	40	80.0	10	20.0
17	Monitor for signs of dehydration or fluid overload	38	76.0	12	24.0
Patient and Family Education					
18	Educate on the disease process of nephrotic syndrome	38	76.0	12	24.0
19	Instruct on recognizing signs of relapse or complications	35	70.0	15	30.0
20	Teach medication administration and adherence	36	72.0	14	28.0
21	Provide dietary and fluid management guidance	37	74.0	13	26.0

Table 4.5 provides insight into how consistently nurses perform various tasks related to the assessment, monitoring, treatment, and education of patients with nephrotic syndrome. Overall, the data reflects a generally high level of adherence to core clinical practices, with a few areas that still require improvement.

1. **Initial Assessment**

The majority of nurses made a concerted attempt to comprehend each child's health from the outset by routinely collecting patient histories (76%) and doing physical examinations (70%). Strong knowledge of early warning indicators linked to fluid balance and renal function was demonstrated by the frequent and routine monitoring of vital signs (72%) and urine output (82%).

2. **Ongoing Monitoring**

In order to demonstrate that they remain on top of important indications, nurses routinely assessed daily weight (82%), recorded intake and output (84%), and examined vital signs (84%). Abdominal girth was measured at a good rate, but a little less frequently (76%) to monitor swelling and fluid accumulation.

3. **Medication Management**

The majority of nurses routinely administered diuretics (76%) and corticosteroids (74%), two essential medications for treating nephrotic syndrome. Antihypertensive drug administration was somewhat less consistent (60%) which may indicate that blood pressure management should be improved. Positively, 84% of nurses were extremely vigilant in monitoring for adverse drug reactions, demonstrating their concern for patient safety throughout treatment.

4. **Nutrition and Fluid Management**

There is potential to improve nutrition counseling, as teaching about a low-sodium diet was less prevalent (64%).

Positively, nurses often informed patients about fluid limitations (80%) and closely monitored symptoms of fluid excess or dehydration (76%).

Monitoring for malnutrition (74%) and promoting a sufficient protein intake (72%) were also handled pretty effectively.

5. Patient and Family Education

The majority of nurses spent time educating families about the illness itself (76%), the significance of taking prescription drugs as prescribed (72%), and the need of eating a healthy diet (74%). Further, less nurses (70%) concentrated on educating families about relapse symptoms, which is crucial for receiving prompt care at home.

The findings show that nurses are doing a solid job overall, particularly with ongoing monitoring and initial assessments. Medication management and patient education are generally handled well, though there's room for improvement in managing blood pressure medications and educating families about recognizing relapse signs. Nutrition counseling, especially around low-sodium diets, stands out as a weaker area and should be prioritized in future training to ensure more comprehensive care.

4.7. Comparative Analysis of the Knowledge and Practices in Pre and Post Educational Intervention

In the current study, education intervention was conducted among head nurses and data was gathered before and after the intervention. In the following Table 4.6 t-test results are given and explained.

Table 4.6

Paired Samples Statistics					
		Mean	N	t-statistic	P
Knowledge	K_Pre_Int.	1.5922	50	12.640	.000
	K_Post_Int.	1.2778	50		
Practices	Prc_Pre_Int.	1.5922	50	12.640	.000
	Prc_Post_In.	1.2778	50		

The educational intervention's outcomes demonstrated a significant improvement in the participants' behaviors and knowledge of nurses' practices and knowledge regarding nephrotic syndrome for the care of the children in Table 4.6. The results in Table 4.6 show that the knowledge and practices before and after the intervention periods differed significantly ($t>1.945$, $P<0.05$). Therefore, it can be concluded that the educational intervention carried out as part of this study has significantly improved the head nurse's knowledge and practices regarding nephrotic syndrome.

5. DISCUSSION

Nephrotic syndrome (NS), which can vary from small, temporary symptoms to more serious disorders that may result in long-term kidney damage, is still a growing concern among children. The experience can be terrifying and unpleasant for both the affected children and their parents. Nurses, who spend the majority of their time with these young children, have a critical role in managing care, providing comfort, and educating families. The goal of this study was to investigate how educational training might enhance nurses' understanding and management of children with NS. The findings of the current study clearly showed that educational guidelines can make a meaningful difference in how nurses understand and care for children with nephrotic syndrome. Before the training, many nurses had significant gaps in their knowledge. They often struggled with understanding what the condition actually is, its common causes like minimal change disease, typical symptoms such as swelling and puffiness, as well as how to interpret diagnostic signs like protein in the urine and high cholesterol levels. They were also less familiar with serious complications, including blood clots and infections (Rodriguez-Ballestas & Reid-Adam, 2022; Zotta et al., 2022).

Further, many nurses weren't consistently following evidence-based practices particularly when it came to initial assessments, giving medications, managing nutrition, or educating families. This was especially true in under-resourced settings, like district hospitals in Pakistan, where standardized care protocols are often lacking (Rodriguez-Ballestas & Reid-Adam, 2022). Before the intervention, many nurses knew the basics of NS before to the intervention, but they lacked in-depth awareness in a few crucial areas. For instance, they were not always sure how to identify early warning signals like weariness, edema, or changes in urine, or what causes the illness, such as minimum change disease. These findings are in line with the recent investigations (Ibrahim et al., 2025; Kallerhult Hermansson et al., 2025).

In hospitals with fewer resources, such as those in rural Pakistan, nurses are frequently required to do many tasks with little assistance or resources. Opportunities for continuous education are scarce, and standardized criteria are not always accessible. This leads to deficiencies in both the clinical expertise and self-assurance required to manage complicated

patients. Studies from other emerging regions reveal similar difficulties, therefore these difficulties are not specific to Pakistan (Jabeen et al., 2024; Khan, 2021)

After the educational intervention, the improvements were striking. Nurses' knowledge significantly improved, with correct answers ranging from 62% to 84% across different areas. They became more confident in identifying key symptoms, using the right diagnostic tools, and recognizing possible complications. While some areas like understanding the importance of a low-sodium diet still needed work, overall, the progress in their understanding of the disease was clear. These finding are concurrent with the previous investigations (H Abdullah et al., 2021; van Houwelingen et al., 2021).

In the post interventional period, nurses started to do assessments in practice with more accuracy and consistency. In addition to communicating with patients and their families more successfully, they conducted more frequent vital sign and fluid balance checks. The use of structured instruction in care grew more commonplace. But several areas, such as the use of antihypertensive drugs and assisting families in identifying relapse symptoms, are still behind schedule and require ongoing care.

Importantly, nurses' interactions with children and their families were also altered by the training. They gained confidence in their ability to provide emotional support, teach caregivers what to look out for at home, and explain the situation in straightforward words. In order to assist parents feel more educated and in control of their treatment, family education became a more significant component of care. This change is crucial for treating a chronic illness like NS. Of course, there is still opportunity for improvement. When it came to controlling blood pressure or identifying relapse symptoms, several nurses were still hesitant. This indicates that one-time instruction is insufficient and that continuous assistance, refresher courses, and practical mentorship are equally crucial. Regular training helps nurses maintain confident in their treatment and keep their knowledge current, according to similar research conducted in other nations (Balante et al., 2021; Mlambo et al., 2021). The findings of this study are simple yet impactful, nurses are more than capable of providing compassionate, high-quality care if they are provided with the appropriate resources, education, and assistance. Children with nephrotic syndrome may benefit greatly from such kind of care, not only in terms of therapy but also in terms of recovery and hope (Wang et al., 2023).

Conclusion

The results unequivocally show that planned training programs greatly improve nurses' clinical practices and understanding of juvenile nephrotic syndrome. Better support for impacted families, early detection of difficulties, as well as more effective treatment are all possible outcomes of these advancements. Sustaining high-quality juvenile nephrotic syndrome treatment requires ongoing training and focused teaching, particularly in areas like nutrition and long-term follow-up.

Theoretical Implications

This study emphasizes how important nursing education is, especially when caring for children with long-term conditions such as Nephrotic Syndrome. It underlines how proper, structured training may considerably enhance nurses' knowledge and everyday care skills. This adds validity to the idea that being a great nurse requires lifelong learning and enhances patient care. The study also offers insight on how education contributes to improving healthcare systems. Nurses who are well-prepared can take a more active role in illness management and improving patient outcomes. It serves as a reminder that robust, supportive training programs may establish the groundwork for more successful and consistent healthcare delivery.

Finally, this study adds in the literature how the educational intervention can transform the knowledge and practices of the nurses towards the care of the children suffered from Nephrotic Syndrome. The study also demonstrates that education has a tangible impact on nurses' work practices outside the classroom. When they learn new knowledge, they implement it, so improving the quality of care for children. In short, this study reminds us that investing in nurse education benefits patients' health.

Practical Implications

This study highlights some important takeaways for improving healthcare in practical ways. First, it shows that authorities, particularly in developing nations such as Pakistan, should carefully consider investing in regular training programs for nurses, particularly those caring for children. Nurses who are more educated are better prepared to care for children with illnesses like Nephrotic Syndrome, giving them a higher chance of recovering and living healthier lives.

It is not only about patient care; these educational programs also assist nurses' advance in their careers. With the correct training, people gain confidence and capability, which may lead to feeling happier at work and remaining in the field for longer. That benefits both nurses and the healthcare system.

Hospitals may need to reconsider their resource distribution, particularly in underdeveloped countries. Spending money on training programs is an investment in improved care, not a cost. Furthermore, regardless of the nurse on duty, all children will get the same high-quality care due to clear, uniform standards. Furthermore, the study's methodology of training followed by assessment can be adjusted to accommodate a wide range of geographic locations and medical conditions. Therefore, findings can be helpful that might assist enhance treatment in numerous areas where it's most needed.

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