

# Implementation Path and Effect Evaluation of Health Education in Pediatric Nephrology Nursing

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**Abstract:** *Objective:* To explore the scientific implementation path of health education in pediatric nephrology nursing and evaluate its impact on children's rehabilitation and parents' nursing ability. *Methods:* A total of 80 children with pediatric nephropathy admitted to our hospital from January 2023 to December 2024 were randomly divided into an experimental group and a control group, with 40 cases in each group. The control group received routine health education, while the experimental group implemented a systematic health education path of "admission assessment–phased education–discharge guidance–follow-up reinforcement". The parents' mastery of nursing knowledge, children's treatment compliance, and disease recurrence rate were compared between the two groups. *Results:* The parents' nursing knowledge score in the experimental group ( $89.6 \pm 5.3$ ) was significantly higher than that in the control group ( $67.2 \pm 7.1$ ). The children's treatment compliance rate in the experimental group was 95.0%, which was higher than 72.5% in the control group, and the recurrence rate was 7.5%, which was lower than 25.0% in the control group. All differences were statistically significant ( $p < 0.05$ ). *Conclusion:* The systematic health education path can improve parents' nursing ability, enhance children's treatment compliance, and reduce the risk of disease recurrence, which is worthy of clinical promotion.

**Keywords:** Pediatric nephropathy; Health education; Implementation path; Effect evaluation; Treatment compliance

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## 1. Introduction

Pediatric nephropathy is characterized by a long course, high recurrence rate, and complex treatment, such as nephrotic syndrome and glomerulonephritis, which seriously threaten children's physical and mental health. Due to the children's young age and insufficient cognitive ability, the effect of treatment and nursing is highly dependent on the cooperation of parents. Clinical practice has found that most parents lack professional knowledge of nephropathy nursing and have misunderstandings in diet management, medication supervision, etc., leading to poor treatment compliance and repeated illness in children. Traditional health education is single in form and scattered in content, with limited effect. Therefore, constructing a scientific implementation path of health

education and strengthening parents' nursing ability are crucial to improving the prognosis of children. This study took 80 children as subjects to explore the application effect of systematic health education, providing a basis for clinical nursing.

## **2. Research data and methods**

### **2.1. General information**

A total of 80 children with pediatric nephropathy admitted to the Department of Pediatric Nephrology of our hospital from January 2023 to December 2024 were selected.

#### **2.1.1. Inclusion criteria**

Meeting the diagnostic criteria for pediatric nephropathy in "Nephrology", course of disease  $\geq 1$  month, parents' informed consent and cooperation with the study;

#### **2.1.2. Exclusion criteria**

Complicated with severe cardiopulmonary, hepatic and renal diseases, neurological disorders, and inability to complete follow-up.

#### **2.1.3. Study group**

They were divided into two groups with 40 cases each by random number table method. In the control group, there were 23 males and 17 females, aged 3–12 years, with an average of  $(7.5 \pm 2.3)$  years, including 22 cases of nephrotic syndrome and 18 cases of nephritic nephropathy; In the experimental group, there were 21 males and 19 females, aged 3–13 years, with an average of  $(7.8 \pm 2.1)$  years, including 20 cases of nephrotic syndrome and 20 cases of nephritic nephropathy. There were no statistically significant differences in gender, age, condition and other data between the two groups ( $p > 0.05$ ), which were comparable.

## **2.2. Experimental methods**

In order to ensure the scientificity and comparability of the study, the two groups adopted different health education modes on the basis of the same standardized drug treatment and routine nursing. The control group implemented the traditional routine health education mode, which was relatively simple and extensive. Specifically, after the child was admitted to the hospital, the responsible nurse would conduct a brief verbal explanation to the parents within 1–2 days, mainly involving the basic ward system (such as visiting time, ward hygiene requirements, safety precautions, etc.), the general concept of pediatric nephropathy, common clinical symptoms and the general direction of treatment. At the time of discharge, the nurse would briefly inform the parents of the key points of the child's diet (such as "eat less salt and light food") and medication (such as "take medicine on time"), and distribute a general health education manual printed uniformly by the hospital. The manual mainly includes the basic knowledge of pediatric nephropathy, common nursing problems and simple solutions, but there is no personalized content for each child. After the child is discharged, there is no special follow-up and reinforcement measure for health education, and only the parents are reminded to bring the child to the hospital for re-examination on time according to the doctor's advice. The experimental group adopted a systematic, whole-process and personalized health education path, which was carefully designed and strictly implemented around the four core links of

“admission assessment–phased education–discharge guidance–follow-up reinforcement”, forming a closed-loop management of health education. The specific implementation details are as follows:

(1) Admission assessment

Within 24 hours after the child is admitted to the hospital, the responsible nurse with rich clinical experience and good communication skills is responsible for conducting a comprehensive and detailed assessment. The assessment content includes two aspects: the child’s side and the parent’s side. For the child, the nurse mainly understands the specific type of nephropathy, the course of the disease, the current clinical symptoms (such as edema, urine changes), the results of relevant examinations (such as urine routine, blood biochemistry), the child’s age, personality characteristics, living habits and the degree of fear of treatment. For parents, the nurse focuses on understanding their educational level, occupation, daily care time for the child, the existing knowledge of pediatric nephropathy nursing (through a self-made preliminary questionnaire), cognitive needs (such as which aspects of nursing they want to know most), and even the family’s economic situation (to provide reference for formulating a cost-effective diet plan). Based on the assessment results, the nurse establishes a personalized health education file for each child, clearly records the key points of education and the focus of guidance, and lays a foundation for the subsequent phased education.

(2) Phased education

This link is carried out throughout the child’s hospitalization period, and is divided into three stages: early, middle and late, with different educational focuses. In the early stage of hospitalization (1–3 days), the focus is on alleviating the parents’ anxiety and popularizing the basic knowledge of the disease. The nurse uses easy-to-understand language to explain the etiology, pathogenesis, clinical manifestations and treatment principles of the child’s specific type of nephropathy to the parents, and answers the parents’ doubts one by one to eliminate their misunderstandings about the disease. In the middle stage of hospitalization (4–7 days), the focus is on in-depth explanation of key nursing knowledge and skills. The nurse carries out centralized lectures twice a week, with each lecture lasting about 40 minutes. The lecture content covers diet management (detailed explanation of low-salt and high-quality protein intake standards, such as how much salt to eat per day, which foods are high-quality protein and their appropriate intake, and which foods should be avoided), medication norms (detailed introduction of the type, dosage, administration time, action mechanism of the drugs used by the child, especially the observation of the side effects of hormone drugs and coping methods), and complication prevention (such as how to prevent infection, skin damage caused by edema, etc.). In addition to centralized lectures, the nurse also conducts one-on-one targeted demonstrations for parents, such as teaching parents how to accurately measure the child’s urine volume, how to observe the color and properties of urine, how to do skin care for edematous children, and how to take the child’s body temperature and blood pressure correctly. For the child, the nurse uses vivid and interesting animations, picture books and cartoon videos to popularize the relevant knowledge of the disease and treatment, and through interactive games, alleviate the child’s fear of injection, medication and examination, and improve the child’s initiative to cooperate with treatment. In the late stage of hospitalization (1–2 days before discharge), the focus is on reviewing and consolidating the nursing knowledge and skills learned by the parents, and checking the mastery of the key points through on-site questions and return demonstrations.

(3) Discharge guidance

Before discharge, the nurse formulates a personalized discharge guidance plan based on the child's recovery and the results of the phased education assessment. The core content includes customizing a detailed diet recipe (combining the child's taste preferences and family economic conditions, specifying the types and amounts of three meals a day, snacks and fruits), formulating a detailed medication schedule (making a medication reminder card with the drug name, dosage, administration time and precautions, and reminding parents to set a mobile phone reminder), and demonstrating the key points of home nursing operations again (such as urine output monitoring, edema care, infection prevention). At the same time, the nurse informs the parents of the signs of disease recurrence (such as sudden deteriorate of edema, significant reduction of urine volume, abnormal urine color) and the emergency treatment measures, and leaves the contact information of the responsible nurse and the department, so that the parents can consult in time when encountering problems.

(4) Follow-up reinforcement

This link is the extension of in-hospital health education and the key to ensuring the long-term effect of nursing. The nurse establishes a WeChat group for the parents of the children in the experimental group, and arranges a special nurse to be responsible for daily management. The nurse pushes a piece of targeted nursing knowledge every week (such as nursing points in different seasons, dietary adjustments during the child's recovery period, etc.), and releases the latest information about pediatric nephropathy treatment and nursing. Every month, the nurse conducts a telephone follow-up for each child, inquiring about the child's medication compliance, diet implementation, physical condition (such as whether there is edema, abnormal urine), and the parents' nursing problems in the process of home care, and gives timely answers and guidance. Every 3 months when the child comes to the hospital for re-examination, the nurse conducts a face-to-face health education effect evaluation, uses the self-made nursing knowledge questionnaire to test the parents again, understands the implementation of home nursing, and provides supplementary guidance for the existing problems, so as to ensure the continuity and effectiveness of health education. Throughout the implementation of the entire health education path, the head nurse of the department conducts regular supervision and inspection every week, checks the completion of the health education file, listens to the feedback of parents and nurses, and adjusts and optimizes the education plan in time to ensure the quality of health education.

### 2.3. Observation indicators

(1) Parents' mastery of nursing knowledge

A self-made questionnaire was used for evaluation at discharge, covering 6 dimensions including nephropathy knowledge, diet nursing, and medication nursing, with a full score of 100 points, and  $\geq 80$  points as qualified.

(2) Children's treatment compliance

Evaluated through outpatient follow-up and parents' feedback. Children who can take medicine on time, cooperate with re-examination, and follow dietary requirements are fully compliant; those who partially do so are partially compliant; those who cannot do so at all are non-compliant. Compliance rate = (number of fully compliant + partially compliant cases) / total number of cases  $\times 100\%$ .

(3) Disease recurrence rate

During 6 months of follow-up, count the number of children with aggravated symptoms due to improper

nursing or treatment interruption and the recurrence rate.

## 2.4. Research statistics

SPSS 26.0 statistical software was used to process the data. Measurement data were expressed as ( $\bar{x} \pm s$ ), and inter-group comparison was performed by *t*-test; Count data were expressed as rate (%), and  $\chi^2$  test was used.  $p < 0.05$  was considered statistically significant. This study was approved by the hospital ethics committee, and all children's parents signed informed consent forms.

## 3. Results

There were statistically significant differences in parents' mastery of nursing knowledge, children's treatment compliance, and disease recurrence rate between the two groups ( $p < 0.05$ ), as shown in **Table 1**.

**Table 1.** Comparison of parents' mastery of nursing knowledge, children's treatment compliance and disease recurrence rate between the two groups

Group	Number of cases	Parents' nursing knowledge score (points, $\bar{x} \pm s$ )	Treatment compliance rate (%)	Recurrence rate (%)
Experimental group	40	89.6 $\pm$ 5.3	95.0 (38/40)	7.5 (3/40)
Control group	40	67.2 $\pm$ 7.1	72.5 (29/40)	25.0 (10/40)
<i>t</i> / $\chi^2$ Value	-	17.236	6.461	4.501
<i>p</i> Value	-	< 0.001	0.011	0.034

Note: Compared with the control group,  $p < 0.05$

## 4. Discussion

This study provides robust evidence for the clinical value of the systematic health education path in pediatric nephrology nursing. Specifically, compared with the control group, parents in the experimental group demonstrated significantly higher scores in nursing knowledge assessment, children exhibited better treatment compliance, and the overall disease recurrence rate was notably lower. These findings fully confirm that the systematic health education path can effectively address the inherent deficiencies of the traditional health education model and substantially enhance the quality of pediatric nephrology nursing services.

The core contradiction in pediatric nephrology nursing lies in the mismatch between the "highly professional nursing needs" of the disease and the "insufficient cognitive and nursing abilities" of children and their parents. As the main force of family nursing, parents' abilities directly determine the nursing effect. However, the traditional health education, characterized by "one-way indoctrination and one-size-fits-all", results in vague content and disconnection between in-hospital and out-of-hospital education, leading to parents' unclear mastery of key nursing knowledge. This is precisely the main reason for the high recurrence rate in the control group<sup>[1]</sup>.

In contrast, the systematic health education path developed for the experimental group precisely targets and resolves this core issue, with its advantages manifested in three key aspects. Firstly, personalized design based on admission assessment: by comprehensively evaluating the child's condition and the parents' cognitive needs, the education program avoids the blindness of a uniform approach, ensuring that the content is more aligned

with the actual needs of each family <sup>[2]</sup>. For instance, for parents with lower educational attainment, nurses utilize more intuitive demonstrations and simplified language, while for busy working parents, the focus is placed on teaching efficient nursing methods and setting up convenient reminders, thereby significantly improving parents' acceptance and mastery of nursing knowledge. Secondly, phased in-hospital education that transforms professional knowledge into actionable skills: unlike the traditional model which merely informs parents of "what to do", the systematic path elaborates on "why it is necessary" and "how to do it well". Through group lectures and one-on-one demonstrations, abstract concepts such as "low-salt and high-quality protein diet" are translated into specific food lists and intake standards, and complex tasks like "urine output monitoring" are broken down into simple, clear operational steps. This not only strengthens parents' confidence in providing nursing care but also ensures the standardization of nursing practices. Thirdly, post-discharge follow-up reinforcement that fills the gap in out-of-hospital nursing management. Given that pediatric nephropathy requires long-term treatment, the duration of out-of-hospital nursing far exceeds that of in-hospital care. The systematic path employs WeChat group knowledge pushes and monthly telephone follow-ups to maintain unobstructed communication between nurses and parents, promptly addressing problems encountered by parents in home nursing and preventing the interruption of health education after discharge <sup>[3]</sup>. This continuous supervision and guidance ensure the long-term implementation of nursing measures, effectively reducing the risk of disease recurrence caused by improper home care. Additionally, the systematic path also attends to the emotional needs of children, which is another important factor in improving treatment compliance. By using animations, picture books, and interactive games, nurses communicate with children in an accessible manner, alleviating their fear of treatment and helping them recognize that "cooperating with treatment can be a positive experience", thus transforming children from passive recipients to active participants in their care. This benign nursing model featuring "parent-led and child-participated" forms a synergistic force for the child's recovery, which is distinctly superior to the traditional model that focuses solely on parents while neglecting children's emotional states. Furthermore, the head nurse's full-process supervision ensures the quality of the health education implementation, with regular inspections and feedback mechanisms preventing perfunctory execution by individual nurses and guaranteeing strict adherence to each step of the path <sup>[4]</sup>.

Despite these promising results, this study has certain limitations that warrant attention. First, the effective implementation of the systematic health education path imposes high requirements on nurses' comprehensive qualities, including professional knowledge, communication skills, assessment capabilities, and sense of responsibility. Currently, there are variations in the professional competence of nurses across different hospitals, which may affect the large-scale promotion of this path. Therefore, hospitals should strengthen specialized training for pediatric nephrology nurses, with a particular focus on enhancing their health education abilities to provide talent support for the path's popularization. Second, the 6-month follow-up period of this study primarily focuses on the short-term effects of the health education path. Since the treatment and prognosis of pediatric nephropathy are long-term concerns, the long-term impacts of the path on children's growth and development, renal function protection, and quality of life require further observation. In the future, extending the follow-up period to 1–2 years and incorporating additional assessment indicators such as children's growth and development parameters, renal function indices, and family quality of life would enable a more comprehensive evaluation of the path's long-term value. Third, as a single-center study with participants all recruited from our hospital, there may be potential selection bias. The generalization of the research findings to other regions and hospitals of different levels necessitates verification through multi-center, large-sample clinical studies. Additionally, with the advancement of information technology, integrating more intelligent tools into the health education path, such

as developing a dedicated health education APP for pediatric nephropathy with functions including personalized knowledge pushes, medication reminders, online consultations, and data recording, would further improve the convenience and efficiency of health education, providing more robust support for the rehabilitation of children with nephropathy <sup>[5]</sup>.

## 5. Conclusion

In conclusion, the systematic health education path encompassing “admission assessment–phased education–discharge guidance–follow-up reinforcement” demonstrates significant advantages in enhancing parents’ nursing abilities, improving children’s treatment compliance, and reducing disease recurrence rates. It not only optimizes the quality of pediatric nephrology nursing but also innovates the nursing service model, establishing a new type of nursing relationship centered on the child and involving family participation. This model aligns with the development trend of modern pediatric nursing and holds important clinical significance and promotion value. It is anticipated that through the popularization and continuous optimization of this path, more children with nephropathy will benefit, and their quality of life and long-term prognosis will be further improved.

## Disclosure statement

The authors declare no conflict of interest.

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