Retrospective Study

Influence of transitional nursing on the compliance behavior and disease knowledge of children with purpura nephritis

Li Li, Li Huang, Ning Zhang, Chun-Mei Guo, Yan-Qun Hu

ORCID number: Li Li 0000-0002-1609-6153; Li Huang 0000-0001-6295-1248; Ning Zhang 0000-0002-1586-1802; Chun-Mei Guo 0000-0002-6848-553X; Yan-Qun Hu 0000-0003-1483-5503.

Author contributions: Li L designed this retrospective study; Huang L and Zhang N wrote this paper; Guo CM and Hu YQ were responsible for sorting the data.

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Abstract

BACKGROUND
Purpura nephritis, also called Henoch-Schönlein purpura nephritis, is a systemic disease with small dead vasculitis as the main pathological change.

AIM
To observe the influence of transitional nursing activities on the compliance behaviors and disease knowledge of children with purpura nephritis.

METHODS
A total of 82 children with purpura nephritis were included and divided into a general nursing group (41 children) and transitional nursing group (41 children) using the envelope method. The general nursing group received routine nursing care, while the transitional nursing group received transitional nursing care. The behaviors, knowledge of the disease, and self-management ability of the two groups were evaluated after nursing care was provided.

RESULTS
The scores of four items (self-care ability, self-responsibility, health knowledge level, and self-concept) in the transitional nursing group were significantly higher than those in the general nursing group.

CONCLUSION
Transitional nursing can directly improve the disease knowledge level and self-management ability of children with purpura nephritis and effectively reduce complications.
INTRODUCTION

Purpura nephritis, also called Henoch-Schönlein purpura nephritis, is a systemic disease with small dead vasculitis as the main pathological change[1-3]. Clinical studies have suggested that the disease is caused by stimuli such as parasitic infections and drug or food allergies[4, 5], and epidemiological analysis has shown that the incidence of the disease has increased in recent years[6].

Most children with purpura nephritis require long-term treatment to control progression of the disease. In addition to hospital care, other activities during the whole disease control process, such as effective outpatient management by children or their families, directly impact the outcome of the disease. Therefore, it is necessary to help children acquire knowledge of related illnesses and improve their self-management ability during clinical care activities, enable children to effectively manage themselves outpatient, and prevent the occurrence of associated complications[7].

Studies have shown that conventional nursing can help children effectively control the progression of their disease in clinical practice. However, it is often impossible for children to effectively manage themselves after hospital discharge. Some scholars have pointed out that transitional nursing can help such children gain knowledge about related diseases and improve their self-care ability. A total of 82 such children were enrolled in this study to observe the clinical value of transitional nursing in this patient population.

MATERIALS AND METHODS

General information

A total of 82 children with purpura nephritis, who were admitted to our hospital from February 2017 to April 2019 and met the related criteria in the Guidelines for the Diagnosis and Treatment of Purpura Nephritis (2016), which was prepared by the Nephrology Group of the Chinese Academy of Pediatrics, were included. Then they were divided into a transitional nursing group and a general nursing group using the envelope method, with 41 patients in each group. There was no significant difference in the demographic information between the two groups.

Inclusion and exclusion criteria

The inclusion criteria were as follows: age 4 to 12, no severe renal impairment, healthy mental development and no severe mental disorders, atypical mania with autism, capable of following nursing guidance, and children and their families being informed of all contents of this study and voluntarily signing an agreement with our hospital.

The exclusion criteria were as follows: severe cardiac insufficiency or respiratory failure, withdrawal from the study midway, incomplete clinical data, and failure to fully meet the above inclusion criteria.
**General nursing group**

With parental consent, clinical nurses registered the necessary information of the children and established personal records for them. After hospital admission, a routine nursing assessment, including assessment of emotional state and severity of the disease, was performed, and health education was provided according to the disease knowledge of the children and their families.

At discharge, nurses provided 0.5 h of health education and advised patients on matters requiring attention in daily life.

**Transitional nursing group**

A nursing team was formed. This team consisted of a competent physician, a head nurse and three responsible nurses, who were trained before providing nursing care to acquire knowledge about transitional care, thereby ensuring that children could receive different levels of care in the same location and effective health care services when they were transferred to a different location. The duration of training was 7 d.

During hospitalization, the patients were comprehensively evaluated. Specifically, their past medical history and the causes of their disease were analyzed; their conditions were comprehensively observed; their renal function was graded by observation of the color and nature of the urine; and the results were recorded in the children’s files. Stress was emphasized on skincare, and the size, location, daily regression, etc. of the purpura were observed.

Upon discharge, the nursing team was mainly responsible for predischarge assessment, life guidance, and follow-up after discharge so that children could receive effective continuous care and treatment in the discharge process. Nurses performed a systematic assessment at discharge, evaluated the physiological state of the children, determined their cognitive state, performed a general examination, and formulated a corresponding comprehensive discharge plan according to the problems that still existed. Children or their parents were advised that the child receive a light diet in their daily life and to avoid irritating foods. A personal nutrition intake table that included information about the calories, trace elements, etc. needed for the daily diet was constructed for the children. Parents were told that children who had abdominal pain outside the hospital should fast in time. Children should eat more fruits and vegetables during the recovery period, but all food intakes need to be observed long-term to screen for food allergies. Follow-up after discharge was conducted via telephone, WeChat and drop-in visits, at a frequency of once weekly, twice weekly and twice monthly, respectively, to understand the rehabilitation and compliance behaviors of children at home, answer the questions of children’s parents, provide them with effective guidance, and strengthen the achievements of education in the hospital.

**Observation indicators**

The questionnaire measured children’s/parent’s knowledge of the disease. Their mastery levels were scored based on daily medication, skincare, diet management, etc. The grading was quantified, with 100 as the maximum score, as follows: The mastery rate of knowledge = (total number of cases–the number of cases of the low level)/total number of cases × 100%. The patients were classified as having a low mastery level (scored 0-59), medium mastery level (scored 60-85), or high mastery level (composed 86-100). Children’s self-management ability was evaluated using the exercise of self-care agency (ESCA) scale, which includes four dimensions: Self-concept, health knowledge level, self-care skills, and self-care responsibility. The higher the score for each size, the stronger the self-care ability. The compliance behaviors were evaluated based on the aspects of no drug abuse, no unauthorized withdrawal, adherence to the physician’s advice, and diet control. The higher the score, the better the compliance behaviors. The incidence of complications during follow-up for the two groups was compared.

**Statistical analysis**

SPSS 23.0 software was used to analyze the data. Mean ± standard deviation measurement data, which were subjected to t-tests, and percentages were used to describe categorical data, which were subjected to χ² tests. The results with \( P < 0.05 \) were statistically significant.
RESULTS

ESCA score
Multiple ESCA scores in the transitional nursing group were significantly higher than those in the general nursing group ($P < 0.05$; Tables 1 and 2).

Compliance behaviors
As shown in Table 3, multiple scores of compliance behaviors in the transitional nursing group were significantly higher than those in the general nursing group ($P < 0.05$).

Mastery level of knowledge
As shown in Table 4, the mastery level of disease-related knowledge in the transitional nursing group was significantly higher than that in the general nursing group ($P < 0.05$).

Complications
According to the data in Table 5, the incidence of complications in the transitional nursing group was significantly lower than that in the general nursing group ($P < 0.05$).

DISCUSSION

Henoch-Schönlein purpura nephritis is a common disease in children$^{[8-10]}$. Clinical studies have shown that the disease is an allergic reaction caused by bacteria, such as Legionella or Salmonella, viruses such as rubella virus or varicella virus, parasites such as roundworm and Mycoplasma, etc.$^{[11,12]}$. Failure to effectively control the disease severely impacts renal function. Epidemiological analysis has shown that the incidence of purpura nephritis has increased in recent years$^{[13]}$. The disease has a long treatment cycle and is prone to recurrent attacks$^{[10]}$. Approximately 90% of children are readmitted to the hospital for secondary treatment$^{[15]}$.

Given the characteristics of the disease, children require effective nursing care during treatment. However, it is difficult for children and their parents to perform effective outpatient nursing care because of the lack of disease-related knowledge, which quickly leads to disease recurrence and rehospitalization in children$^{[14]}$. Transitional nursing refers to nursing during the specific period when pediatric patients are discharged, which can improve the quality of nursing care and the outpatient management ability of children and their parents by effectively evaluating the conditions of children and judging the consistency of the diet, treatment and medication administration$^{[6,17]}$.

A clinical team was formed to guide the children and their parents on properly performing urine examinations and skincare, thereby supplying children with effective care at home and further preventing disease recurrence.

The four scores of compliance behaviors in the transitional nursing group were significantly higher than those in the general nursing group. In addition, the transitional nursing group had a significantly lower incidence of complications during follow-up than the general nursing group. The results showed that determining the problems of the children through predischarge evaluation and offering guidance to them allowed well-directed guidance and helped the children and their parents learn about the daily diet, medication, and other matters needing attention. Multiple forms of follow-up were used to urge children and their parents to follow the hospital care guidance at home, check and compensate for weak links, help the parents conduct daily monitoring, determine the possible allergens in everyday life, further reduce the complications in the children and prevent disease recurrence or aggravation.

Due to the convertibility of clinical nursing activities, transitional nursing aims to extend professional nursing care activities for children with purpura nephritis from inpatient care to daily outpatient life, having significant advantages in the nursing of patients with many kinds of diseases with a long course and susceptibility to recurrence$^{[18,19]}$. In addition, nursing activities emphasize the supervisory role of parents in the daily nursing care of children. Children’s parents should receive education so that their ability to monitor can be improved, ensuring that nurses, parents, and children can all participate in nursing activities$^{[11]}$. Ni et al$^{[19]}$ studied the clinical application value of transitional nursing during discharge of children with purpura nephritis. The observation group received transitional nursing care, and the
Table 1 Comparison of baseline data between the transitional nursing group and general nursing group

| Baseline data                     | Transitional nursing group, n = 41 | General nursing group, n = 41 | χ²/t   | P value |
|-----------------------------------|-----------------------------------|------------------------------|--------|---------|
| Gender, n (%)                     |                                   |                              |        |         |
| Male                              | 23 (56.10)                        | 22 (53.66)                   | 0.120  | 0.729   |
| Female                            | 18 (43.90)                        | 19 (46.34)                   | 0.119  | 0.730   |
| Household registration            |                                   |                              |        |         |
| Urban                             | 20 (48.78)                        | 19 (46.34)                   | 0.383  | 0.703   |
| Rural                             | 21 (51.22)                        | 22 (53.66)                   | 0.501  | 0.618   |
| Age in yr                         | 8.66 ± 1.05                       | 8.72 ± 1.08                  | 0.077  | 0.939   |
| Course of disease in d            | 11.52 ± 1.32                      | 11.67 ± 1.39                 |        |         |
| Weight in kg                      | 26.24 ± 4.14                      | 26.31 ± 4.08                 |        |         |
| Body mass index in kg/m²          | 23.15 ± 1.58                      | 23.01 ± 1.47                 |        |         |

Table 2 Comparison of exercise of self-care agency scores between the two groups, mean ± standard deviation, score

| Group                        | Transitional nursing group, n = 41 | General nursing group, n = 41 | t       | P value |
|------------------------------|-----------------------------------|------------------------------|---------|---------|
| Self-care responsibility     | 26.31 ± 4.58                      | 20.16 ± 3.97                 | 6.497   | 0.001   |
| Self-concept                 | 25.14 ± 3.51                      | 19.16 ± 3.02                 | 8.269   | 0.001   |
| Self-care skills             | 34.71 ± 4.52                      | 25.74 ± 4.02                 | 9.495   | 0.001   |
| Self-care knowledge          | 43.61 ± 4.87                      | 35.87 ± 4.03                 | 7.840   | 0.001   |

Table 3 Comparison of compliance performance rating between the two groups, mean ± standard deviation, score

| Group                        | Number of cases | Follow the doctor's advice | No drug abuse | Diet control | No unauthorized withdrawal |
|------------------------------|-----------------|----------------------------|---------------|--------------|---------------------------|
| Transitional Nursing Group   | 41              | 3.16 ± 0.51               | 3.24 ± 0.45   | 3.19 ± 0.52  | 3.28 ± 0.43               |
| General Nursing Group        | 41              | 2.21 ± 0.37               | 2.24 ± 0.33   | 2.31 ± 0.43  | 2.06 ± 0.31               |
| t                            | -               | 9.654                     | 11.475        | 8.351        | 14.737                    |
| P value                      | -               | 0.001                     | 0.001         | 0.001        | 0.001                     |

Table 4 Comparison of mastery levels of knowledge between the two groups, n (%)

| Group                        | Number of cases | High mastery level | Medium mastery level | Low mastery level | Knowledge mastery rate |
|------------------------------|-----------------|--------------------|----------------------|------------------|-----------------------|
| Transitional nursing group   | 41              | 31 (75.61)         | 9 (21.95)            | 1 (2.44)         | 40 (97.56)            |
| General nursing group        | 41              | 20 (53.66)         | 10 (24.39)           | 11 (26.83)       | 30 (73.17)            |
| χ²                           | -               | 10.539             | 0.167                | 23.808           | 23.808                |
| P value                      | -               | 0.001              | 0.683                | 0.001            | 0.001                 |

countrol group received routine nursing care. The results showed that both the compliance rate and the mastery rate of purpura nephritis knowledge after receiving nursing care in the observation group were significantly higher than those in the control group. In contrast, the observation group had a substantially shorter length of stay than the control group.

Imam et al.[20] investigated the readmission risk of children with clinical purpura and found that the parents and families with more knowledge of purpura nephritis and the children with stronger self-care ability had lower readmission rates and the children with higher compliance performance scores had higher quality of life. However, this study was short-term, and the sample size was relatively small. In addition, the author believes that the purpose of transitional nursing care is to emphasize the nursing
Table 5 Comparison of complications between the transitional nursing group and general nursing group, n (%)  

| Group               | Number of cases | Abdominal pain and diarrhea | Infection | Hematochezia | Other | Incidence of complications |
|---------------------|-----------------|-----------------------------|-----------|--------------|-------|---------------------------|
| Transitional nursing group | 41              | 2 (4.88)                    | 1 (2.44)  | 1 (2.44)     | 3 (7.32) | 7 (17.07)                 |
| General nursing group  | 41              | 4 (9.76)                    | 3 (7.32)  | 2 (4.88)     | 5 (12.20)| 14 (34.15)                |
| $\chi^2$            | -               | 1.755                       | 2.565     | 0.844        | 1.352 | 7.706                     |
| $P$ value           | -               | 0.185                       | 0.109     | 0.358        | 0.245 | 0.006                     |

measures in the particular period when pediatric patients are discharged and is mainly used to improve the children’s cognition of disease and self-care ability. However, there remain some limitations in only relying on transitional nursing during this particular period. As a standard measure in the nursing care of some diseases with a long course and susceptibility to recurrence, continuous nursing can compensate for the deficiency of transitional nursing care in children with purpura nephritis and achieve the goal of controlling disease recurrence through inpatient, discharge, and outpatient nursing activities.

**CONCLUSION**

Transitional nursing can effectively improve the disease cognition, self-management ability, and compliance rate of children with purpura nephritis and reduce the incidence of outpatient complications. Thus, it has a high promotion value.

**ARTICLE HIGHLIGHTS**

**Research background**

Purpura nephritis, also called Henoch-Schönlein purpura nephritis, is a systemic disease with dead small vasculitis as the main pathological change.

**Research motivation**

Some clinical studies have suggested that the disease is caused by stimuli such as parasitic infections and drug or food allergies, and epidemiological analysis shown that the incidence of the disease has increased in recent years.

**Research objectives**

The aim of the study was to observe the influence of transitional nursing activities on compliance behaviors and disease knowledge of children with purpura nephritis.

**Research methods**

The general nursing group received routine nursing care, and the transitional nursing group received transitional nursing care. The behaviors, knowledge of disease, and self-management ability of the two groups were evaluated after nursing care was provided.

**Research results**

The scores of four items (self-care ability, self-responsibility, health knowledge level and self-concept) in the transitional nursing group were significantly higher than those in the general nursing group.

**Research conclusions**

Transitional nursing can effectively improve the disease cognition, self-management ability, and compliance rate of children with purpura nephritis and reduce the incidence of outpatient complications, and it has a high promotion value.
Research perspectives
As a common measure in the nursing care for some diseases with a long course and susceptibility to recurrence, continuous nursing can compensate for the deficiency of transitional nursing care in children with purpura nephritis and achieve the goal of controlling disease recurrence through inpatient, discharge, and outpatient nursing activities.

REFERENCES
1. Yu Y, Chen J, Yin H, Deng Z, Xie Y, Yuan Q, Xu H, Liu S, Tao L, Peng Z. Efficacy of steroid and immunosuppressant combined therapy in Chinese patients with Henoch-Schönlein purpura nephritis: A retrospective study. *Int Immunopharmacol* 2020; **81**: 106229 [PMID: 32041710 DOI: 10.1016/j.intimp.2020.106229]
2. Yun D, Kim DK, Oh KH, Joo KW, Moon KC, Kim YS, Lee K, Han SS. MEST-C pathological score and long-term outcomes of child and adult patients with Henoch-Schönlein purpura nephritis. *BMC Nephrol* 2020; **21**: 33 [PMID: 32000703 DOI: 10.1186/s12882-020-1691-5]
3. Zheng X, Chen Q, Chen L. Obesity is associated with Henoch-Schönlein Purpura Nephritis and development of end-stage renal disease in children. *Ren Fail* 2019; **41**: 1016-1020 [PMID: 31735105 DOI: 10.1080/0886022X.2019.1685515]
4. Rostoker G. Schönlein-henoch purpura in children and adults: diagnosis, pathophysiology and management. *BioDrugs* 2001; **15**: 99-138 [PMID: 11437679 DOI: 10.2165/00003030-200115020-00004]
5. Karasawa K, Iwabuchi Y, Kyoda M, Akihisa T, Yamaguchi E, Suzuki S, Ogura S, Takabe T, Miyabay E, Kamiyama T, Nakano M, Manabe S, Kamiyama M, Akiyama K, Sato M, Uchida K, Nitta K, Moriyama T. Primary IgA Vasculitis with Nephritis in a Patient with Rheumatoid Arthritis Diagnosed by Anti-galactose-deficient IgA1 Immunostaining. *Intern Med* 2019; **58**: 2551-2554 [PMID: 31178497 DOI: 10.2169/internalmedicine.2660-19]
6. Delbet JD, Hogan J, Aoun BI, Stoica I, Salomon R, Deczamer S, Brocheriou I, Descheñes G, Ulinski T. Clinical outcomes in children with Henoch-Schönlein purpura nephritis without crescents. *Pediatr Nephrol* 2017; **32**: 1193-1199 [PMID: 28204946 DOI: 10.1007/s00467-017-3649-0]
7. Tsukada H, Miyakawa H. Henoch Schönlein Purpura Nephritis Associated with Intravesical Bacillus Calmette-Guerin (BCG) Therapy. *Intern Med* 2017; **56**: 541-544 [PMID: 28250302 DOI: 10.2169/internalmedicine.56.7496]
8. Fan L, Yan H, Zhen X, Wu X, Hao J, Hou L, Han L. Safety and Efficacy Evaluation of Traditional Chinese Medicine (Qingre-Lishi-Yishen Formula) Based on Treatment of Regular Glucocorticoid Combined with Cyclophosphamide Pulse in Children Suffered from Moderately Severe Henoch-Schönlein Purpura Nephritis with Nephrotic Proteinuria. *Evid Based Complement Alternat Med* 2020; **2020**: 3920735 [PMID: 32047523 DOI: 10.1155/2020/3920735]
9. Ekinci RMK, Balci S, Melek E, Karabay Bayazit A, Dogrue D, Altintas DU, Yilmaz M. Clinical manifestations and outcomes of 420 children with Henoch Schönlein Purpura from a single referral center from Turkey: A three-year experience. *Mod Rheumatol* 2019; **1-8** [PMID: 31662010 DOI: 10.1080/14397595.2019.1687074]
10. Ding Y, Zhang X, Ren X, Zhai W, He L, Liu J, Yao C, Han S, Wang L. Traditional Chinese medicine versus regular therapy in Henoch-Schönlein purpura nephritis in children: study protocol for a randomized controlled trial. *Trials* 2019; **20**: 538 [PMID: 31464626 DOI: 10.1186/s13063-019-3484-3]
11. Zhang J, Lv J, Pang S, Bai X, Yuan F, Wu Y, Jiang H, Yang G, Zhang S. Chinese herbal medicine for the treatment of Henoch-Schönlein purpura nephritis in children: A prospective cohort study protocol. *Medicine (Baltimore)* 2018; **97**: e11064 [PMID: 29901610 DOI: 10.1097/MD.0000000000011064]
12. Mira FS, Marques D, Sousa V, Nogueira C, Garcia R, Alves R. Parvoviral infection with systemic impact and renal consequences. *BMJ Case Rep* 2019; **12**: e229622 [PMID: 31771796 DOI: 10.1136/bcr-2019-229622]
13. Zieg J, Stolbova S, Kroulikova V, Hacek J. Odontogenic focal infection is a possible trigger of severe Henoch-Schönlein purpura nephritis. *Minerva Pediatr* 2018; **70**: 202-204 [PMID: 29446581 DOI: 10.23736/S0026-4947.17.04779-X]
14. Umeda C, Fujinaga S, Endo A, Sakuraya K, Asanuma S, Hirano D. Preventive Effect of Tonsillectomy on Schönlein-henoch purpura in children and adults: diagnosis, pathophysiology and management. *Minerva Pediatr* 2018; **70**: 61-69 [PMID: 31996498 DOI: 10.1620/tjem.250.61]
15. Wang P, Tang L, Yao J, Su H, Liu Y, Kong X, Li W, Cui M, Sun Q, Zhen J, Xu D. The spectrum of biopsy-proven secondary glomerular diseases: A cross-sectional study in China. *Clin Nephrol* 2017; **88**: 270-276 [PMID: 28793953 DOI: 10.5414/CN109115]
16. Yang Y, Zhang Z, Zhuo L, Chen DP, Li WG. The Spectrum of Biopsy-Proven Glomerular Disease in China: A Systematic Review. *Chin Med J (Engl)* 2018; **131**: 731-735 [PMID: 29521297 DOI: 10.4103/0366-6999.226906]
17. Fox MT, Sidani S, Butler JI, Skinner MW, Alzghoud M. Protocol of a multimethod descriptive study: adapting hospital-to-home transitional care interventions to the rural healthcare context in Ontario, Canada. *BMJ Open* 2019; **9**: e028050 [PMID: 31295959 DOI: 10.1136/bmjopen-2018-028050]
18. Pereira M, Muscat E, Eldin K, Hicks MJ, Sagaral-Gironella ACP, DeGuzman M, Wenderer SE. Clinical presentation and outcomes of childhood-onset membranous lupus nephritis. *Pediatr Nephrol* 2017; **32**: 2283-2291 [PMID: 28717937 DOI: 10.1007/s00467-017-3743-4]
19. Ni W, Colayco D, Hashimoto J, Komoto K, Gowda C, Wearda B, McCombs J. Impact of a pharmacy-based transitional care program on hospital readmissions. *Am J Manag Care* 2017; **23**: 170-176 [PMID: 28385023]
20. Imam AA, Ibrahim HE, Farghaly MAA, Alkholly UM, Gawish HH, Abdalmonem N, Sherif AM, Ali YF,
Hamed ME, Waked NM, Fathy MM, Khalil AM, Noah MA, Hegah MS, Ibrahim BR, Nabil RM, Fattah LA. Vitamin D receptor gene FokI polymorphism in Egyptian children and adolescents with SLE: A case-control study. *Lupus* 2017; 26: 1426-1434 [PMID: 28799838 DOI: 10.1177/0961203317725588]
