

Effects of intravenous therapy nursing group on continuing nursing of children discharged with peripherally inserted central catheter

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ABSTRACT

Objective: To assess the effects of intravenous therapy nursing group on continuing nursing of children discharged with peripherally inserted central catheter (PICC).

Methods: Eighty children discharged with PICC from our hospital between January 2018 and October 2019 were randomly divided into control group (n=40) and observation group (n=40) according to the random number table method. Control group received conventional continuing nursing, while observation group received intravenous therapy nursing group intervention during continuing nursing. The scores of self-management ability, comfort level, negative emotion and quality of life, incidence rate of catheter adverse events and nursing satisfaction were compared.

Results: The incidence rate of catheter adverse events was lower in observation group than that in control group (2.50% vs. 15.00%) ($P < 0.05$). After nursing, the scores of self-management ability, comfort level and quality of life were higher in observation group than those in control group ($P < 0.05$), while the SAS and SDS scores were lower in observation group ($P < 0.05$). The total nursing satisfaction rate was higher in observation group than that in control group (97.50% vs. 82.5%) ($P < 0.05$).

Conclusion: The application of intravenous therapy nursing group in continuing nursing of children discharged with PICC can strengthen children's self-management ability, reduce catheter adverse events, improve comfort level, relieve negative emotion, and ameliorate the quality of life, thus making them more satisfied with the nursing service.

KEYWORDS: peripherally inserted central catheter; discharge; continuing nursing; intravenous therapy nursing group

INTRODUCTION

Peripherally inserted central catheter (PICC), the main venous pathway for long-term infusion treatment, can reduce the times of vein puncture and achieve continuous infusion treatment [1]. However, PICC patients need long-term catheterization, and there is often a lack of guidance after discharge, so their self-care ability is weak, and catheter adverse events occur easily, thus affecting their quality of life. Hence, it is necessary to conduct nursing intervention [2]. Continuing nursing is a coherent nursing model that extends from inside to outside the hospital. In recent years, it has been proposed to implement intravenous therapy nursing group intervention

during continuing nursing for patients discharged with PICC. Intravenous therapy nursing group intervention is a type of group nursing intervention model specially aiming at intravenous infusion treatment, whose nursing service is more professional and nursing measures more comprehensive. The aim of this study was to investigate the role of intravenous therapy nursing group in continuing nursing of children discharged with PICC.

MATERIALS AND METHODS

Baseline clinical data

Eighty children discharged with PICC from our hospital during January 2018 - October 2019 were enrolled and randomly divided into control group (n=40) and observation group (n=40) according to the random number table method. In control group, there were 21 boys and 19 girls aged 12-16 years old, with a mean of (14.41 ± 2.14) years old, including 10 cases of leukemia, 12 cases of Wilms'

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tumor and 18 cases of neuroblastoma. In observation group, there were 22 boys and 18 girls aged 12-16 years old, with a mean of (14.28 ± 2.31) years old, including 9 cases of leukemia, 13 cases of Wilms' tumor and 19 cases of neuroblastoma. The age, gender and disease types were comparable between the two groups ($P > 0.05$). This study was approved by the Ethics Committee of the hospital, and the guardians of all patients signed the informed consent.

Methods

Children in control group received conventional continuing nursing. After discharge, they were followed up by phone every 2 weeks, inquiries were made about the condition of the children' catheter, and the children and their family members were told to return for revisit on time.

Children in observation group received intravenous therapy nursing group intervention during continuing nursing. An intravenous therapy nursing group was set up, and the group members included 1 head nurse, 1 chief nurse, 2 supervisor nurses, 4 senior nurses and 10 nurses. They were organized to participate in the professional training for PICC nursing and regularly learn new PICC-related techniques. Then, they formulated nursing plans according to the nursing needs of patients discharged with PICC, specifically as follows: (1) Health education before discharge: Before discharge, health education was strengthened for patients and their family members. The maintenance methods of PICC and matters needing attention were explained in detail. Besides, electronic health files were created for patients, and follow-up cards and PICC maintenance manuals were issued to patients. In addition, the patients and their family members were instructed to record each medicine change on the follow-up card after discharge, and the patients were required to carry the follow-up card with them during each revisit. (2) Follow-up after discharge: The patients were followed up by phone weekly. They were informed again about the matters needing attention in their daily life during the call, and asked if they have any questions. All the problems of the patients were recorded and answered. Besides, home follow-up of patients was made every 4 weeks to observe the catheter condition, communicate face-to-face with the patients, and strengthen their guidance. Before discharge, each patient's WeChat account was added, and they were invited to join the WeChat group of intravenous therapy nursing intervention. In the WeChat group, questions were answered and real-time guidance was provided through WeChat

Voice and Video for the patients. (3) Special time visit: Patients with PICC are prone to nursing problems at night. When the patients discharged from the hospital, the nurse should provide the contact number of the nursing group to them. When the patients had an emergency at night, they could call the nursing group immediately, and the nurse would guide the patients and their family members to deal with the emergency in real time and appeases the patients. Patients in both groups received intervention for 3 months.

Observation indices

The following indices were compared between the two groups. (1) Score of self-management ability: It was evaluated by the self-nursing ability scale, which is divided into four dimensions: self-concept, self-responsibility, self-nursing skills and mastery of health knowledge, with a total score 100 points for each dimension. The score is proportional to the ability of self-management [3]. (2) Incidence rate of catheter adverse events. (3) Comfort level score: It was assessed using the General Comfort Questionnaire (GCQ). The score ranges from 28 to 112 points, which is proportional to the comfort level [4]. (4) Negative emotion scores: They were assessed using the Self-rating Anxiety Scale (SAS) and Self-rating Depression Scale (SDS). The scores range from 0 to 100 points, which are proportional to the degrees of anxiety and depression [5]. (5) Quality of life score: It was assessed using the World Health Organization Quality of Life Scale Brief (WHOQOL-BREF), which is divided into four dimensions (physiological, psychological, environmental and social relations). The score ranges from 0 to 100 points for each dimension, proportional to the quality of life [6]. (6) Nursing satisfaction: It was surveyed using a self-made questionnaire with a total score of 100 points: very satisfied (81-100 points), generally satisfied (60-80 points) and dissatisfied (0-59 points). The total satisfaction rate was the sum of very satisfied rate and generally satisfied rate.

Statistical analysis

SPSS 26.0 software was utilized for statistical analysis. The numerical data were expressed as ratio and subjected to χ^2 test. The quantitative data were expressed as $(\bar{x} \pm s)$ and subjected to *t*-test. $P < 0.05$ suggested that the difference was statistically significant.

RESULTS

Scores of self-management ability

After nursing, the score of self-management

ability was significantly higher than that before nursing in both groups ($P<0.05$), and it was higher

in observation group than that in control group ($P<0.05$) (Table 1).

Table 1. Scores of self-management ability ($\bar{x} \pm s$, point)

Group	Time	Mastery of health knowledge	Self-concept	Self-responsibility	Self-nursing skills
Control (n=40)	Before nursing	71.84±5.46	72.19±6.02	71.92±5.91	71.35±5.48
	After nursing	78.21±6.35 [#]	78.94±6.75 [#]	78.35±6.43 [#]	77.64±6.30 [#]
Observation (n=40)	Before nursing	71.97±5.52	72.32±6.14	72.07±5.98	71.47±5.56
	After nursing	85.30±7.09 ^{#*}	86.07±7.13 ^{#*}	86.12±7.76 ^{**}	85.09±7.45 ^{#*}

[#] $P<0.05$ vs. before nursing, ^{*} $P<0.05$ vs. control group.

Incidence rates of catheter adverse events

The incidence rate of catheter adverse events in

observation group was lower than that in control group (2.50% vs. 15.00%) ($P<0.05$) (Table 2).

Table 2. Incidence rates of catheter adverse events [n (%)]

Group	n	Catheter slippage	Catheter infection	Catheter block	Total incidence rate
Control	40	2 (5.00)	3 (7.50)	1 (2.50)	6 (15.00)
Observation	40	0 (0)	1 (2.50)	0 (0)	1 (2.50) [*]

^{*} $P<0.05$ vs. control group.

Comfort level scores

After nursing, the comfort level score was higher than that before nursing in both groups ($P<0.05$),

and it was higher in observation group than that in control group ($P<0.05$).

Table 3. Comfort level scores ($\bar{x} \pm s$, point)

Group	Comfort level score	
	Before nursing	After nursing
Control (n=40)	78.16±7.20	87.33±8.45 [#]
Observation (n=40)	78.47±7.31	98.50±10.17 ^{**}

[#] $P<0.05$ vs. before nursing, ^{*} $P<0.05$ vs. control group.

Negative emotion scores

After nursing, the SAS and SDS scores were decreased in contrast with those before nursing in

both groups ($P<0.05$), and they were lower in observation group than those in control group ($P<0.05$) (Table 4).

Table 4. Negative emotion scores ($\bar{x} \pm s$, point)

Group	Time	SAS score	SDS score
Control (n=40)	Before nursing	54.57±6.91	55.28±6.74
	After nursing	47.23±5.47 [#]	48.37±5.86 [#]
Observation (n=40)	Before nursing	54.43±6.95	55.16±6.80
	After nursing	41.68±4.83 ^{#*}	42.40±5.19 ^{#*}

[#] $P<0.05$ vs. before nursing, ^{*} $P<0.05$ vs. control group.

Quality-of-life scores

After nursing, the quality-of-life score was higher than that before nursing in both groups

($P<0.05$), and it was higher in observation group than that in control group ($P<0.05$) (Table 5).

Table 5. Quality-of-life scores ($\bar{x} \pm s$, point)

Group	Time	Physiological	Psychological	Environmental	Social relations
Control (n=40)	Before nursing	74.56±5.09	75.38±5.20	74.27±4.81	75.09±5.18
	After nursing	82.09±6.53 [#]	83.12±6.17 [#]	81.35±5.03 [#]	82.94±5.23 [#]
Observation (n=40)	Before nursing	74.68±5.04	75.52±5.13	74.39±4.75	75.20±5.04
	After nursing	88.45±6.37 ^{#*}	89.45±6.28 ^{#*}	87.46±5.14 ^{**}	88.57±5.69 ^{#*}

[#] $P<0.05$ vs. before nursing, ^{*} $P<0.05$ vs. control group.

Nursing satisfaction

The total nursing satisfaction rate was higher in

observation group than that in control group (97.50% vs. 82.5%) ($P < 0.05$) (Table 6).

Table 6. Nursing satisfaction [n (%)]

Group	n	Very satisfied	Generally satisfied	Dissatisfied	Total satisfaction rate
Control	40	18 (45.00)	15 (37.50)	7 (17.50)	33 (82.50)
Observation	40	22 (55.00)	17 (42.50)	1 (2.50)	39 (97.50)*

* $P < 0.05$ vs. control group.

DISCUSSION

PICC is a kind of central venous puncture and catheterization technique that is widely applied in clinical practice. Through peripheral venipuncture, the central venous catheter is placed into and fixed in the superior vena cava or inferior vena cava. The patients can use the catheter for a long time, so repeated venipuncture is avoided [7,8]. However, during the long-term use of PICC, due to lack of scientific and reasonable nursing guidance after the patient is discharged, the self-nursing ability of the patients is low, and the catheter is short of maintenance. As a result, there is a high risk of catheter adverse events, and the quality of life of PICC patients is affected after discharge. To ensure the effect of infusion treatment on PICC patients, it is necessary to carry out nursing intervention during the catheterization period after discharge.

Continuing nursing, a commonly used out-of-hospital nursing model, is extended from the dual dimensions of space and time. Through follow-up of patients after discharge, the post-discharge nursing problems of patients can be solved, thus strengthening post-discharge health management [9]. However, the conventional continuing nursing is neither professional nor systematic, and the nursing effect on patients still needs to be improved. Intravenous therapy nursing group is a nursing group specially set up for intravenous infusion treatment. Compared with conventional continuing nursing, the application of intravenous therapy nursing group intervention in continuing nursing can make up for the deficiency of professionalism of conventional continuing nursing, and provide patients with more professional post-discharge nursing services [10]. Meanwhile, the intravenous therapy nursing group strengthens the communication with patients after discharge, which helps better understand the patients' condition dynamically. For example, upon emergency, the patients can get the right care at the first time [11].

The results of this study manifested that: (1) After nursing, the score of self-management ability was higher in observation group than that in control group ($P < 0.05$), and the incidence rate of catheter

adverse events was lower in observation group than that in control group (2.50% vs. 15.00%) ($P < 0.05$), suggesting that the application of intravenous therapy nursing group can improve the effect of continuing nursing, strengthen patients' self-management ability, and reduce the risk of catheter adverse events. (2) After nursing, the comfort level score and quality-of-life score were higher in observation group than those in control group ($P < 0.05$), while the SAS and SDS scores were lower in observation group than those in control group ($P < 0.05$), and the total nursing satisfaction rate was higher in observation group than that in control group (97.50% vs. 82.50%) ($P < 0.05$). It is mainly because the application of intravenous therapy nursing group reduced the catheter adverse events, thus relieving the impact of catheter adverse events on patients' physical and mental comfort and quality of life, and thereby improving their nursing satisfaction.

In conclusion, the application of intravenous therapy nursing group in continuing nursing of patients discharged with PICC can strengthen their self-management ability, reduce catheter adverse events, improve their comfort level, relieve their negative emotion, and ameliorate their quality of life, thus making them more satisfied with the nursing services.

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