Application of the Cox Health Behavior Interactive Nursing Model in Blood Purification Patients with Chronic Renal Failure and Its Impact on Self-Management Ability

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Abstract: *Objective:* To observe the application of the Cox healthy behavior interactive nursing model in patients with chronic renal failure and blood purification and its impact on their self-management ability. *Methods:* 82 patients with chronic renal failure and blood purification in our hospital (from January 2025 to December 2025) were randomly divided into a control group (41 cases) of routine care and an observation group (41 cases) of the Cox healthy behavior interactive care model. *Results:* Compared with the control group, the observation group had higher self-management ability scores, lower complication rates, higher satisfaction scores, and higher quality of life scores, $P < 0.05$. *Conclusion:* The Cox healthy behavior interactive nursing model for blood purification patients with chronic renal failure can improve patients' self-management ability, reduce the incidence of complications, alleviate negative emotions, and promote the improvement of quality of life, which is worth learning from.

Keywords: Cox health behavior interactive nursing model; Chronic renal failure; Blood purification; Self-management ability

1. Introduction

Chronic renal failure is a common disease. The occurrence of this disease is mainly due to the damage to the structure and function of the kidneys under the influence of various factors, which leads to the continuous decline of renal function and the eventual loss of renal function, which has a great impact on the patient's quality of life and survival time [1]. In the treatment of this disease, blood purification is an effective method. It can partially replace kidney function during treatment and prolong the survival time of patients. However, many patients still face many risks during the treatment [2]. For patients, self-management is a very important aspect of auxiliary treatment. If the patient has good self-management ability, it can improve treatment cooperation and better cope with the physical and mental impact of the disease, which will help delay the progression of the disease [3]. In the routine nursing process, more attention is paid to the disease itself and treatment and care, and no attention is paid to the cultivation of patients' self-management ability, which has obvious shortcomings. Based on this, the Cox healthy behavior interactive nursing model has attracted attention. This study selected 82 patients

with chronic renal failure and blood purification in our hospital to observe the implementation effect of this nursing model.

2. Materials and methods

2.1. General information

82 patients with chronic renal failure and blood purification in our hospital from January 2025 to December 2025 were selected and randomly divided into 2 groups. There were 41 patients in the control group, 24 males and 17 females, aged 27 to 67 (47.75 ± 3.27) years old, with disease duration of 2 to 9 (5.34 ± 1.23) years, and dialysis time of 1 to 4 (2.43 ± 0.85) years. There were 41 patients in the observation group, 23 males and 18 females, aged 26 to 68 (47.68 ± 3.34) years old, with disease duration of 2 to 8 (5.41 ± 1.30) years, and dialysis time of 1 to 4 (2.38 ± 0.77) years. Comparison of general data, P > 0.05.

Inclusion criteria: all met the diagnostic criteria for chronic renal failure [4]; had regular blood purification for more than 3 months; were mentally normal; expected survival time was more than 3 months.

Exclusion criteria: blood system diseases; cognitive and communication abnormalities; missing medical records.

2.2. Method

Control group: Closely observe the changes in the condition during the treatment process, deal with abnormalities in time, and introduce the disease and treatment knowledge to the patients as well as home self-care precautions.

Observation group:

(1) The patient needs to communicate with the patient and their family members within 24 hours after admission. During this period, patiently inquire about the patient's situation and gain an in-depth understanding of various aspects of information, such as medical history, disease development process, treatment status, etc. They should also understand the patient's work and rest situation, whether the evaluation is regular, understand hobbies, such as exercise, etc., understand eating habits, and understand whether there are special dietary taboos, and ask whether they have personalized requirements for nursing methods, etc., and formulate corresponding care plans based on the above information.

(2) Closely monitor the patient's dialysis process and pay attention to changes in blood pressure, blood flow, heart rate, etc. If any abnormality in the above indicators is found, report it to the doctor in a timely manner and handle it. At the same time, the condition of the catheter should be closely observed to avoid abnormal problems, such as discounting, falling off, etc. After dialysis is completed, positive pressure sealing is performed. This operation must be performed in accordance with the specifications to obtain a better sealing effect and avoid blockage of the pipeline due to blood coagulation.

(3) Provide corresponding dietary plans taking into account the patient's physical condition and nutritional status. During the diet selection process, avoid high-fat and greasy foods and choose a low-fat and high-quality protein diet, which is 1.2 to 1.4 kJ/kg per day. Ensure that patients consume enough high-quality protein, such as fish, lean meat, eggs, etc., and at the same time ensure active supplementation of nutrients, including reasonable consumption of fruits, vegetables, and grains.

(4) Encourage patients to engage in more daily activities and actively communicate with family members and patients. This will help reduce psychological stress in the process of constant contact. During the communication period, nursing staff also need to provide effective guidance to the patient, through encouragement, comfort, etc., to understand the patient's inner thoughts, get timely answers to their questions, and further explain the positive effects of blood purification treatment.

(5) Communicate one-on-one with the patient twice a week for 15 minutes each time. During this period, the patient will be informed about chronic renal failure and blood purification, as well as self-management skills. Through the above content, the patient will improve his or her understanding of the disease and be confident in the treatment process. You can also provide them with health education manuals and urge patients to study them at any time. Use

the Internet to establish an online platform for communication with patients, where knowledge about chronic renal failure and blood purification can be regularly sent to create a good therapeutic atmosphere for them.

(6) The patient's health status and self-management behavior need to be comprehensively evaluated regularly, and the entire care plan is adjusted based on the obtained evaluation results to ensure that the relevant content is consistent with the patient's changing actual needs. If patients show difficulties or deficiencies in self-management in some aspects, they need intensive supervision and guidance to help them better cope with the problem.

2.3. Observation indicators

(1) Self-management ability: Self-management behavior scale for hemodialysis patients (SMSH);

(2) Complication rate;

(3) Satisfaction: Self-made satisfaction evaluation form, with a total score of 100 points, a total of 5 aspects, 20 points each;

(4) Quality of life: Brief Health Scale (SF-36).

2.4. Statistical methods

SPSS26.0 software processes data. Measurement data is expressed as: mean ± standard deviation (SD), t test is used. Count data is expressed as: (n, %). The test is used. $P < 0.05$ means the difference is statistically significant.

3. Results

3.1. Comparison of self-management capabilities

After intervention, the observation group was higher than the control group, $P < 0.05$ (**Table 1**).

Table 1. Comparison of self-management abilities (points, mean ± SD)

Group	Emotional processing		Partnership		Problem solving		Practice self-care	
	Before intervention	After intervention	Before intervention	After intervention	Before intervention	After intervention	Before intervention	After intervention
Control group (n = 41)	15.84 ± 2.84	18.23 ± 1.26	11.74 ± 2.12	14.59 ± 1.52	14.11 ± 2.18	16.38 ± 2.73	14.17 ± 2.11	15.38 ± 2.14
Observation group (n = 41)	15.68 ± 2.65	20.74 ± 2.36	11.57 ± 2.46	17.39 ± 1.69	14.23 ± 2.23	19.72±2.56	14.30 ± 2.14	18.72 ± 2.55
t	0.264	6.008	0.335	7.888	0.246	5.714	0.277	6.424
P	0.793	0.000	0.738	0.000	0.806	0.000	0.783	0.000

3.2. Comparison of complication rates

The observation group was lower than the control group, $P < 0.05$ (**Table 2**).

Table 2. Comparison of complication rates (n, %)

Group	Heart failure	Catheter/Fistula Infection	Anemia	Total
Control group (n = 41)	2 (4.88)	1 (2.44)	3 (7.32)	6 (14.63)
Observation group (n = 41)	0 (0.00)	0 (0.00)	1 (2.44)	1 (2.44)
χ^2	-	-	-	3.905
P	-	-	-	0.048

3.3. Comparison of satisfaction

The observation group was higher than the control group, $P < 0.05$ (**Table 3**).

Table 3. Comparison of satisfaction (points, mean ± SD)

Group	Nursing skills	Nursing attitude	Nursing responsibility	Nurse-patient communication	Health guidance	Total score
Control group ($n = 41$)	16.78 ± 0.82	16.77 ± 0.73	17.11 ± 0.67	17.34 ± 0.74	16.85 ± 0.64	88.32 ± 2.46
Observation group ($n = 41$)	18.62 ± 0.67	18.47 ± 0.85	18.26 ± 0.60	18.34 ± 0.73	18.52 ± 0.62	93.48 ± 2.61
t	11.126	9.715	8.187	6.160	12.000	9.212
P	0.000	0.000	0.000	0.000	0.000	0.000

3.4. Comparison of quality of life

The observation group was higher than the control group, $P < 0.05$ (**Table 4**).

Table 4. Comparison of quality of life (minutes, mean ± SD)

Group	Social function	Emotional function	Mental health	Energy	General health	Physiological function	Somatic pain	Physiological functions
Control group ($n = 41$)	76.84 ± 2.19	76.94 ± 2.62	74.82 ± 3.63	75.93 ± 2.94	75.82 ± 2.18	76.92 ± 2.83	75.23 ± 2.19	77.93 ± 2.28
Observation group ($n = 41$)	80.73 ± 2.84	79.93 ± 2.49	78.49 ± 2.34	79.93 ± 2.62	78.33 ± 2.43	79.40 ± 2.71	80.73 ± 2.45	80.49 ± 2.82
t	6.915	5.474	4.830	6.504	4.923	4.053	10.717	4.520
P	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

4. Discussions

Blood purification treatment plays an important role in patients with chronic renal failure. It can use special filters to filter the patient's blood. This process is conducive to the effective removal of waste and excess fluid accumulated in the blood. It is also conducive to maintaining the balance of the internal chemical environment of the human body and keeping the body's water and electrolytes in a stable state. This treatment method has remarkable effects. It not only helps alleviate various symptoms caused by the disease, but also reduces the incidence of complications to a large extent and prolongs the patient's life. However, the blood purification treatment process is complex. During the treatment period, relying only on medical equipment and medical staff cannot achieve the ideal therapeutic effect, which further increases the requirements for the patients themselves. They must actively participate in self-management to ensure that the blood purification treatment proceeds smoothly. Therefore, attention must be paid to improving the patient's self-management ability during nursing care.

Under the Cox healthy behavior interactive nursing model, more emphasis is placed on the effective establishment of interactive communication between nursing staff and patients. During the implementation process, patients need to be comprehensively assessed, and corresponding interactive plans are formulated based on the assessment results. During the interaction process, patients can be given multiple forms of guidance and support, and at the same time, patients can participate in nursing work, improve their self-care abilities, and promote their own healthy behaviors [5]. In the results of this study, the self-management ability score of the observation group was higher than that of the control group ($P < 0.05$).

The reason is that under the Cox Health Behavior interactive care model, patients can have an in-depth understanding of various aspects of their information during the early stages of admission, and then develop personalized care plans, which will help patients feel the attention of nursing staff and improve their self-management willingness. During the nursing period, face-to-face knowledge education is carried out, health manuals are distributed, and online communication platforms are established to improve patients' understanding of the disease and treatment from different aspects, further realizing the importance of self-management, and thus improving self-management ability [6]. The incidence of complications in the observation group was lower than that in the control group ($P < 0.05$). The reason is that during the implementation of Cox Health Behavior Interactive Nursing, the patient's dialysis process can be closely monitored, abnormalities in relevant indicators can be detected and dealt with on time, and the status of vascular access can be observed, effectively preventing complications caused by dialysis operations and pipeline problems. At the same time, providing patients with dietary plans to avoid bad eating habits and intake of relevant nutrients can further improve the body's resistance and reduce the risk of complications [7]. The satisfaction score of the observation group was higher than that of the control group ($P < 0.05$). The reason is that during the nursing period, personalized care plans are developed for patients to meet their special needs, and various indicators of patients are paid close attention to, problems can be dealt with as early as possible, a responsible and professional attitude can be shown to patients, and professional guidance and emotional support are given to patients, which can further provide warmth and care and improve their satisfaction with nursing work [8]. The quality of life score of the observation group was higher than that of the control group ($P < 0.05$). The reason is that the improvement of patients' self-management ability allows them to better cope with various problems during disease treatment and actively carry out daily activities, thereby improving the overall quality of life.

Therefore, the application of the Cox healthy behavior interactive nursing model to patients with chronic renal failure and blood purification is beneficial to improving self-management ability, reducing the occurrence of complications, alleviating negative emotions, improving quality of life, and has promotional value.

Disclosure statement

The author declares no conflict of interest.

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