

To Explore the Effect of Self-determination Theory Nursing Intervention in Hemodialysis Patients with Chronic Renal Failure

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Abstract: *Objective:* To explore the application value of the nursing intervention model based on self-determination theory in hemodialysis patients with chronic renal failure. *Methods:* 68 hemodialysis patients with chronic renal failure admitted to our hospital from January 2024 to December 2024 were selected and divided into two groups using the random number table method, with 34 cases in each group. The routine nursing group implemented traditional hemodialysis nursing measures, and the self-determination nursing group introduced self-determination theory to carry out targeted nursing care on the basis of routine nursing. Compare the psychological state, quality of life and occurrence of complications between the two groups after intervention. *Results:* The SAS score and SDS score of the self-determined nursing group were lower than those of the conventional nursing group, the total SF-36 quality of life score was higher than that of the conventional nursing group, and the incidence of complications was lower than that of the conventional nursing group. The differences were statistically significant ($p < 0.05$). *Conclusion:* Nursing intervention based on self-determination theory can effectively improve the psychological state of hemodialysis patients with chronic renal failure, improve the quality of life, reduce the risk of complications, and has clinical promotion value.

Keywords: Chronic renal failure; Hemodialysis; Self-determination theory; Nursing intervention; Quality of life; Psychological state

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1. Introduction

Chronic renal failure is an end-stage manifestation of multiple clinical chronic kidney diseases. Hemodialysis is a very important core treatment method to maintain the patient's life. Long-term implementation of this treatment can easily cause patients to develop negative emotions such as anxiety and depression, which reduces treatment cooperation, affects the quality of life and increases the probability of complications^[1,2]. Self-determination theory advocates stimulating intrinsic behavioral motivation by satisfying individual autonomy needs, perceptions of competence, and demands for belonging. The practical application of this theory in the field of nursing has gradually gained more attention in recent

years. Compared with traditional nursing forms, nursing intervention based on self-determination theory focuses more on the patient's own subject position, which can fully stimulate the patient's subjective awareness and help him better adapt to the disease treatment process. The current clinical nursing work for hemodialysis patients with chronic renal failure is mostly oriented towards the disease itself. The lack of attention to the patients' psychological appeal and internal motivation lead to unsatisfactory nursing results^[3,4]. Based on this situation, this study integrates self-determination theory into the nursing process of hemodialysis patients with chronic renal failure, builds a targeted nursing intervention model to meet patients' basic psychological needs, and analyzes the impact of this model on patients' psychological state, quality of life, and occurrence of complications. This study provides scientific reference for clinical nursing optimization, hoping to improve patient prognosis and improve clinical nursing service levels.

2. Materials and methods

2.1. General information

68 hemodialysis patients with chronic renal failure admitted to our hospital from January 2024 to December 2024 were selected as cases. Divide into two groups using random number table method. There were 34 patients selected in the self-determination nursing group, including 18 men and 16 men, aged 37 to 68 (45.38 ± 4.06) years old. There were 34 patients selected in the routine care group, 17 men and 17 men, aged 38 to 69 (45.80 ± 3.96) years old. The two groups are comparable, $p > 0.05$.

2.1.1. Inclusion criteria

- (1) Meet the diagnosis of chronic renal failure and undergo regular hemodialysis;
- (2) Have clear consciousness and can cooperate with the intervention;
- (3) Voluntarily participate in this study.

2.1.2. Exclusion criteria

- (1) Combined with severe cardiovascular and cerebrovascular diseases;
- (2) Mental disorder;
- (3) Kidney transplant planned in the near future.

2.2. Method

The routine care group implements traditional hemodialysis care, including monitoring vital signs such as blood pressure and respiration, observing changes in condition during dialysis, providing basic dietary and medication guidance, and informing dialysis-related precautions.

The self-determination nursing group implements nursing intervention based on self-determination theory on the basis of routine care, as follows:

- (1) In terms of autonomy support, nursing staff take the initiative to communicate in depth with patients and their families to fully understand the patients' living habits, interests, preferences, and nursing demands. Under this premise, an individualized care plan is developed together with the patient. For dietary control, we provide a variety of low-salt, low-fat, high-quality, low-protein diet plans based on patients' dietary preferences, such as multigrain rice with steamed fish, vegetable and tofu soup, etc., allowing patients to choose according to their own taste. At the level of exercise guidance, different forms of exercise such as walking and Tai Chi are recommended according to the patient's physical condition, and the duration, frequency and key points of attention are clarified, and the patient plans his or her own exercise arrangement. Regarding matters related to dialysis cooperation, patients are informed in detail about pre-dialysis preparations, key points of cooperation during dialysis, and core post-dialysis care, giving patients sufficient room for decision-making. Respect patients' opinions and suggestions

on care details, encourage them to actively participate in all aspects of care, and enhance patients' awareness of autonomy.

- (2) Competency cultivation adopts a hierarchical and progressive model to carry out health promotion. In the early stage, through the distribution of health manuals with pictures and text, and the broadcast of popular science videos, the pathogenesis of chronic renal failure, the working principle of hemodialysis and the importance of treatment were explained in plain and easy language to help patients establish basic knowledge. In the mid-term, a group lecture was organized, and attending physicians and senior nurses were invited to give lectures, focusing on self-monitoring methods of the disease, such as the correct measurement methods of blood pressure and weight, as well as drug taking periods, dosages, identification of adverse reactions, etc. At the same time, through skill demonstrations, one-on-one tutoring, etc., patients are allowed to practice by themselves until they are proficient. In the later period, nursing effectiveness evaluation will be carried out regularly, and patients' knowledge of disease knowledge and the application of nursing skills will be understood through questionnaire surveys, on-site interviews, etc. Provide timely recognition and praise, provide targeted guidance to address existing deficiencies, help patients gradually improve their ability to cope with the disease, and strengthen their confidence in care. In addition, a patient care diary system is established to encourage patients to record daily diet, exercise and physical feelings. Nursing staff regularly review and comment on it, so that patients can clearly perceive their own progress and further enhance their sense of competence.
- (3) To build a sense of belonging, form patient communication groups with 8–10 people in each group, led by a full-time nurse. Organize offline communication activities once a week, each time lasting about 60 minutes. The activities include sharing of patient care experiences, exchange of experiences on disease treatment, etc. Patients are encouraged to actively express their inner thoughts and encourage and support each other. For patients who are introverted and not good at expressing themselves, nursing staff actively guide them to participate in communication and help them integrate into the group atmosphere. At the same time, nursing staff regularly provide one-on-one psychological counseling to patients, using methods such as listening and empathy to promptly understand the causes of patients' negative emotions. For example, targeted psychological intervention will be carried out for anxiety and depression caused by concerns about treatment effectiveness and financial burden. In addition, small gifts or blessing cards are prepared at special times such as patient birthdays and holidays to create a warm nursing atmosphere. Regularly organize interactive activities between nurses and patients, such as health knowledge competitions, etc., to shorten the distance between nurses and patients and build a harmonious and trusting nurse-patient relationship. Let patients feel the care and support of the nursing team and enhance their sense of belonging. The intervention cycle is set to 6 months. During this period, the nursing plan will be adjusted in a timely manner based on patient nursing feedback and changes in condition to ensure the pertinence and effectiveness of the nursing intervention.

2.3. Observation indicators

The psychological score results (assessed by SAS and SDS) and quality of life scores (assessed by SF-36 total score) of the two groups of patients were compared, and the occurrence of complications (including infection, hypotension, muscle spasm) between the two groups were also recorded.

2.4. Statistical methods

Data were analyzed using SPSS24.0. *t*-test for measurement data; χ^2 test for count data. $p < 0.05$ represents significant difference.

3. Results

3.1. Comparison of SAS and SDS scores between the two groups before and after intervention

After the intervention, both scores of the self-determined nursing group were lower than those of the conventional nursing group ($p < 0.05$), **Table 1**.

Table 1. Comparison of SAS and SDS scores between the two groups before and after intervention ($\bar{x} \pm s$, points)

Group	SAS score (before intervention)	SAS score (post-intervention)	SDS score (before intervention)	SDS score (post-intervention)
Routine care group (34)	56.82 ± 4.35	48.65 ± 3.98	58.24 ± 4.52	49.73 ± 4.16
Self-determined care group (34)	57.13 ± 4.28	39.21 ± 3.56	58.56 ± 4.45	40.35 ± 3.82
<i>t</i>	0.296	10.308	0.294	9.684
<i>p</i>	0.768	0.000	0.770	0.000

3.2. Comparison of SF-36 quality of life total scores between the two groups

There was no significant difference in the total score of SF-36 between the two groups before the intervention ($p > 0.05$). After the intervention, the total score of the self-determined nursing group was higher than that of the conventional nursing group ($p < 0.05$), **Table 2**.

Table 2. Comparison of total scores of SF-36 quality of life between the two groups ($\bar{x} \pm s$, points)

Group	Before intervention	After intervention
Routine care group (34)	52.36 ± 5.12	61.45 ± 5.38
Self-determined care group (34)	52.68 ± 5.06	72.34 ± 5.62
<i>t</i>	0.259	8.162
<i>p</i>	0.796	0.000

3.3. Comparison of complication rates between the two groups

The incidence of complications in the self-determined nursing group was lower than that in the conventional nursing group ($p < 0.05$), **Table 3**.

Table 3. Comparison of complication rates between the two groups [n (%)]

Group	Infection	Hypotension	Muscle spasms	Overall incidence rate [n (%)]
Routine care group (34)	3 (8.82)	3 (8.82)	2 (5.88)	8 (23.53)
Self-determined care group (34)	0 (0.00)	1 (2.94)	0 (0.00)	1 (2.94)
χ^2				4.610
<i>p</i>				0.032

4. Discussion

Patients with chronic renal failure need to rely on hemodialysis for a long time to maintain their lives. This process not only brings continuous pain to the patient's body and is prone to puncture pain, muscle spasm and other discomforts

during dialysis, but also induces psychological distress such as anxiety and depression due to factors such as long treatment period, high financial pressure and restricted lifestyle. These negative emotions will further weaken the patient's cooperation with treatment, cause irregular diet and medication, which will affect the effectiveness of dialysis and form a vicious circle. Ultimately, it will significantly reduce the patient's quality of life and even have an adverse effect on the survival time. Therefore, exploring scientific and feasible nursing intervention methods to break this cycle and improve patients' physical and mental status has become an important issue that needs to be addressed urgently in clinical nursing^[5]. As a motivation theory with strong practical value, the core connotation of self-determination theory is to use targeted measures to meet the two basic psychological needs of individuals' autonomy demands and competency perceptions, fundamentally stimulate individuals' internal motivation and encourage them to actively participate in their own health management, and improve behavioral enthusiasm and persistence^[6,7]. This theory emphasizes that individuals do not passively accept external interference, but have the potential to actively pursue self-improvement and health. When basic psychological needs are fully satisfied, individuals are more likely to establish positive health behavior patterns and better cope with disease challenges. This study is based on this theoretical core, combined with the clinical nursing characteristics and physical and mental appeals of chronic renal failure hemodialysis patients, to build a comprehensive nursing intervention model covering autonomy support and competency cultivation, and effectively integrating the theoretical core into all aspects of daily care. After six months of systematic intervention, it has achieved good results, effectively improved the patients' psychological state and quality of life, and provided a useful reference for clinical care of such patients.

The data of this study show that after the intervention, the SAS scores and SDS scores of the self-determination nursing group were lower than those of the conventional nursing group, indicating that nursing intervention based on self-determination theory can effectively improve patients' psychological conditions. This is because during the nursing period, patients are given autonomy support to participate in the formulation of care plans and respect their choices, which effectively alleviates patients' resistance to passively receiving care. At the same time, it helps patients master knowledge and skills related to disease care through the cultivation of a sense of competence, improves their ability to cope with diseases, and reduces anxiety and depression caused by unknown diseases. In addition, building a sense of belonging helps patients feel cared for and supported by organizing patient communication activities and strengthening nurse-patient communication, and effectively alleviates negative psychology^[8]. In terms of quality of life, the total SF-36 score of the self-determined nursing group after intervention was higher than that of the conventional nursing group, which shows that this nursing model can significantly improve patients' quality of life. The quality of life of long-term hemodialysis patients is generally not high due to disease torture and treatment restrictions. Nursing intervention based on self-determination theory stimulates intrinsic nursing motivation by meeting the two basic psychological needs of patients and improves patients' cooperation with treatment and care. Patients actively comply with dietary regulation, medication specifications and disease monitoring, which effectively reduces the impact of the disease on daily life. The improvement in psychological state makes patients more willing to participate in daily activities, further improving the quality of life. The occurrence of complications is an important basis for judging the role of nursing. In this study, the total incidence of complications in the self-determined nursing group was 2.94%, which was significantly lower than the 23.53% in the conventional nursing group, suggesting that this nursing intervention can reduce the probability of complications in hemodialysis patients with chronic renal failure. Analysis of the reasons: On the one hand, nursing intervention can improve patients' disease awareness, so that they can detect changes in the condition in time and take corresponding measures to reduce the causes of complications. On the other hand, the improvement in patient care cooperation allows for more standardized diet, medication and dialysis cooperation, effectively reducing the possibility of common complications such as infection and hypotension. For example, during dietary guidance, patients proactively follow the principles of a low-salt, high-quality, low-protein diet to reduce complications caused by improper diet. During dialysis, patients actively cooperate with nurses to monitor vital signs and promptly report discomfort, which facilitates timely treatment by nurses and reduces the risk of dialysis-related complications. Nursing intervention guided by self-determination theory is very different from the traditional nursing model. Traditional nursing mostly centers on nurses and patients passively receive

care, and it is difficult to fully mobilize patients' enthusiasm. Nursing intervention based on self-determination theory pays more attention to the patient's subject status and stimulates intrinsic motivation by satisfying their basic psychological needs, allowing patients to transform from passive care to active participation. This transformation not only improves nursing effectiveness but also builds a harmonious nurse-patient relationship. In clinical nursing practice, nurses need to change their nursing concepts, fully respect patients' autonomy, develop personalized care plans based on patients' individual conditions, and focus on cultivating patients' sense of competence and belonging to improve the quality of care^[9,10].

In summary, applying nursing intervention based on self-determination theory to hemodialysis patients with chronic renal failure can effectively improve their psychological state, enhance their quality of life, and reduce the risk of complications. It is a good nursing model and is worthy of clinical promotion.

Disclosure statement

The author declares no conflict of interest.

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