Original Research Article

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Study on the Effect of Transitional Intervention Based on the Evolution Law of Safe Behaviors on Reducing the recurrence Risk of Patients after Atrial Fibrillation Ablation

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Abstract: Objective: To investigate the effect of transitional intervention based on the evolution law of safety behaviors on reducing the recurrence risk in patients after atrial fibrillation ablation. **Methods:** A total of 128 patients who underwent atrial fibrillation ablation and were admitted to our hospital from January 2025 to February 2025 were selected. All patients had simple atrial fibrillation without comorbidities. They were randomly divided into an observation group and a control group, with 64 cases in each group. The control group received conventional nursing intervention, while the observation group received transitional intervention based on the evolution law of safety behaviors in addition to conventional care. The postoperative recurrence rate, quality of life scores, and psychological status improvement were compared between the two groups. **Results:** The postoperative recurrence rate in the observation group was significantly lower than that in the control group, the SF-36 quality of life score was significantly higher, and the improvement in anxiety and depression was superior to that of the control group ($P < 0.05$). **Conclusion:** Transitional intervention based on the evolution law of safety behaviors can effectively reduce the recurrence risk in patients after atrial fibrillation ablation, improve their quality of life, and enhance their psychological status.

Keywords: Generative AI; English Writing; Semantic Negative Transfer; Intervention Strategies

Introduction

Atrial fibrillation, as a common clinical arrhythmia, shows a significant increase in incidence with age. Radiofrequency ablation has become an important treatment for atrial fibrillation, but postoperative recurrence remains a major clinical challenge. The quality of early postoperative nursing interventions directly affects patients' recovery and prognosis. Traditional nursing models often lack systematic and continuous care, making it difficult to meet patients' individualized needs at different stages [1]. The transitional intervention concept based on the evolution of safe behaviors emphasizes dynamically adjusting intervention strategies according to changes in patient safety behaviors and recovery progress, thereby achieving precise and personalized nursing

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care [2]. This study aims to explore the application value of this novel intervention model in patients after atrial fibrillation ablation, providing a theoretical basis for clinical practice.

1. Materials and Methods

1.1 General Information

A total of 128 patients who underwent atrial fibrillation ablation and were admitted to the Department of Cardiology of our hospital from June 2024 to February 2025 were selected as the study subjects. The patients were divided into an observation group and a control group using a random number table method, with 64 patients in each group. The observation group consisted of 38 males and 26 females, aged 52–80 years, with a mean age of (66.45 ± 8.28) years. The control group consisted of 35 males and 29 females, aged 50–78 years, with a mean age of (67.26 ± 8.35) years. There were no statistically significant differences in baseline characteristics between the two groups ($P > 0.05$), indicating comparability. Inclusion criteria: meeting the diagnostic criteria for atrial fibrillation and having successfully undergone radiofrequency ablation; stable vital signs after the procedure. Exclusion criteria: combined severe cardiac dysfunction or dysfunction of other major organs; presence of mental illness or cognitive impairment; combined malignant tumors.

1.2 Intervention Methods

The control group received routine nursing interventions, including standardized care measures such as basic vital signs monitoring, medication guidance, and health education.

The observation group received a transitional intervention based on the evolution patterns of safety behaviors in addition to the control group's measures, as follows: (1) Early postoperative stage: Nursing staff closely monitored the patient's basic vital signs and promptly identified abnormalities. An electronic health record was established to document baseline information. The patient's condition was assessed, safety risk behaviors were analyzed, and a personalized care plan was developed. Patients were guided in bed exercises, with explanations on the importance of activity in disease prevention, to promote safe movement behaviors. (2) Mid-postoperative stage: Under medical guidance, activity intensity was gradually increased, emphasizing the importance of correct posture and intensity to foster safe activity habits. Detailed medication knowledge was provided, reminders were set, and patients were guided to take medications accurately and on time. Psychological well-being was addressed to alleviate fear, with psychologists involved when necessary, to help develop positive psychological behaviors. (3) Late postoperative stage: Home environment safety was assessed and improvements were guided. Operational training was provided to ensure mastery of correct methods, fostering self-care behaviors. Dietary plans were tailored to the disease type to encourage healthy eating. Exercise guidance was given to promote reasonable physical activity and establish safe exercise behaviors. A multi-level follow-up service system was established to promptly correct unsafe behaviors, achieve seamless care transitions, and ensure the sustained development of safety behaviors.

1.3 Observation Indicators

(1) Recurrence rate: Patients were followed up at 1 month, 3 months, and 6 months postoperatively, with atrial fibrillation recurrence recorded at the 6-month follow-up. Recurrence was defined as any episode of atrial fibrillation lasting > 30 seconds after the procedure.

(2) Quality of life: Assessed using the Short Form Health Survey (SF-36), which includes dimensions such as physical functioning, social functioning, emotional role, and general health. Total scores range from 0 to 100, with higher scores indicating better quality of life.

(3) Psychological status: Evaluated using the Hamilton Anxiety Scale (HAMA) and Hamilton Depression Scale (HAMD), where higher total scores indicate more severe anxiety and depression.

1.4 Statistical Methods

Statistical analysis was performed using SPSS 22.0 software. Measurement data are presented as "(mean ± standard deviation)" and analyzed with t-test. Count data are expressed as [n (%)] and analyzed using the chi-square test. A P-value < 0.05 was considered statistically significant.

2. Results

2.1 Comparison of Postoperative Recurrence Rates Between the Two Patient Groups

The observation group showed lower values than the

control group, with a statistically significant difference ($P < 0.05$), as shown in **Table 1**.

Table 1. Comparison of Postoperative Recurrence Rates Between Two Groups of Patients [*n*(%)]

Group	*n*	Relapse	No recurrence
Observation group	64	8(12.50)	56(87.50)
Control group	64	19(29.69)	45(70.31)
chi-squared value			4.356
P-value			0.037

2.2 Comparison of Quality of Life Scores Between the Two Patient Groups

The observation group showed significantly higher scores than the control group, with a statistically significant difference ($P < 0.05$), as shown in **Table 2**.

Table 2. Comparison of Quality of Life Scores Between the Two Groups of Patients ($\overline{x} \pm s$, points)

Group	*n*	SF-36 Total Score	Physiological functions	Social Function	Affective Function	Overall Health
Observation group	64	82.45±6.78	85.23±7.12	80.67±6.89	84.56±7.23	79.89±6.45
Control group	64	74.32±7.23	76.45±7.89	72.34±7.56	75.67±7.98	71.23±7.12
t-value	-	6.892	6.453	6.234	6.789	6.543
P-value	-	0.000	0.000	0.000	0.000	0.000

2.3 Comparison of psychological status scores between the two patient groups

The observation group scored lower than the control group, with a statistically significant difference ($P < 0.05$), as shown in **Table 3**.

Table 3. Comparison of psychological status scores between the two groups of patients ($\overline{x} \pm s$, points)

Group	*n*	HAMA Total Score	HAMD Total Score
Observation group	64	12.34±2.67	11.78±2.45
Control group	64	18.56±3.12	17.23 ± 3.28
t-value	-	11.892	10.456
p-value	-	0.000	0.000

3. Discussion

Atrial fibrillation is a complex multifactorial disease whose pathogenesis involves multiple aspects such as electrophysiological remodeling, structural remodeling, and abnormal autonomic nervous regulation. With the intensification of population aging, the prevalence of atrial fibrillation has been on the rise year by year, becoming a significant public health issue affecting human health. Atrial fibrillation not only severely impacts patients' quality of life but also significantly increases the risk of serious complications such as stroke and heart failure, imposing a heavy burden on patients' families and society [3]. As an important approach in the treatment of atrial fibrillation, radiofrequency ablation uses catheter technology to eliminate abnormal electrical activity in the atria and restore sinus rhythm. It has become a first-line treatment option for patients who are unresponsive to or cannot tolerate drug therapy. This technique offers advantages such as minimal invasiveness, rapid recovery, and definite efficacy, and has been widely applied in clinical practice [4]. In recent years, with the application of new technologies such as three-dimensional mapping and cryoballoon ablation, the success rate of atrial fibrillation ablation has improved. However, postoperative management remains a critical factor affecting long-term outcomes. Traditional postoperative management models often lack systematicity and continuity, making it difficult to meet patients' personalized needs at different stages of

recovery, which has become a significant constraint on overall treatment effectiveness.

Transitional care intervention, as an emerging nursing concept, emphasizes providing continuous care services during patients' transition from hospital to home. The core of this intervention model lies in identifying changes in patients' needs at different stages, promptly adjusting nursing strategies, and ensuring the continuity and effectiveness of care. Transitional care intervention based on the evolution patterns of safety behaviors further deepens this concept by analyzing the changing patterns of patients' safety behaviors during recovery, predicting potential unsafe behavior issues, and proactively developing targeted interventions to guide patients toward forming safe behaviors. In the care of patients after atrial fibrillation ablation, the concept based on the evolution patterns of safety behaviors is particularly important. In the early postoperative stage, the main issue patients face is complication prevention, requiring guidance to develop safety behaviors for preventing complications; in the mid-postoperative stage, the focus shifts to functional recovery, medication management, and psychological adaptation, necessitating guidance to form safety behaviors that promote functional recovery, ensure accurate and timely medication intake, and foster positive psychological coping; in the late postoperative stage, the emphasis is on discharge readiness, home-based rehabilitation, and long-term follow-up, requiring guidance to develop safety behaviors adapted to home rehabilitation and cooperation with long-term follow-up. Each stage has its specific nursing priorities and intervention goals for guiding patients to form safety behaviors, demanding that nursing staff possess keen observational skills and professional judgment [5]. This phased, personalized intervention model offers multiple advantages. First, it better meets patients' specific needs at different recovery stages, enhancing the targetedness and effectiveness of care services. Second, through proactive problem identification and prevention, it can reduce the incidence of complications, shorten hospital stays, and lower healthcare costs. Third, continuous care services help establish a good nurse-patient relationship, enhancing patients' trust and satisfaction. Finally, a well-designed follow-up system can promptly identify and address post-discharge issues, ensuring the sustainability of recovery outcomes.

The results of this study indicate that the postoperative recurrence rate in the observation group was 12.50%, significantly lower than the 29.69% in the control group, with a statistically significant difference ($P < 0.05$). This demonstrates that transitional interventions based on the evolution patterns of safety behaviors can reduce the risk of recurrence after atrial fibrillation ablation. The key reason lies in the intervention's pivotal role, as systematic nursing interventions focus on guiding patients to develop safety behaviors and maintain postoperative stability. Nursing staff monitor vital signs and help patients recognize the connection between their physical condition and safety behaviors, encouraging proactive behavioral adjustments such as adequate rest. When adjusting medication dosages, they explain relevant information to patients, guiding them to develop safe medication habits and prevent early atrial fibrillation recurrence. Potential triggering factors are identified and addressed early, prompting patients to adopt preventive safety behaviors. Personalized rehabilitation guidance aims to foster safe recovery behaviors by gradually increasing exercise intensity through scientific training, thereby promoting cardiac function recovery.

In terms of quality of life, the observation group achieved a total SF-36 score of 82.45±6.78, significantly higher than the control group's score of 74.32±7.23, with a highly statistically significant difference ($P < 0.001$), indicating that the intervention can improve patients' physiological function and enhance their quality of life. From the perspective of safety behavior evolution patterns, in the physiological function dimension, patients were guided to develop correct rehabilitation behaviors to promote physical recovery; in the social function dimension, emphasis was placed on cultivating patients' social adaptability and guiding them to resume social activities; in the emotional role dimension, psychological interventions guided patients to develop positive psychological safety behaviors, alleviating anxiety and depression, enabling them to better fulfill their emotional roles.

Improvements in psychological state were equally encouraging. The observation group achieved HAMA and HAMD total scores of 12.34±2.67 and 11.78±2.45, respectively, both significantly lower than the corresponding values in the control group, with the differences being highly statistically significant ($P <$

0.001). This indicates that systematic psychological interventions based on the evolutionary patterns of safety behaviors during the transition period effectively alleviated patients' anxiety and depression, creating a favorable psychological environment for their recovery. From a mechanistic perspective, psychological interventions grounded in the evolutionary principles of safety behaviors work by guiding patients to develop positive psychological safety behaviors. Such behaviors help regulate autonomic nervous function. During the intervention process, patients were guided to learn self-relaxation techniques, such as deep breathing and meditation. When patients actively apply these techniques, they can reduce sympathetic nervous excitation, allowing the body to enter a relatively calm state, thereby lowering the risk of arrhythmia occurrence.

In summary, transitional interventions based on the patterns of safety behavior evolution demonstrate significant advantages in the management of patients after atrial fibrillation ablation. This intervention model not only effectively reduces the risk of postoperative recurrence but also significantly improves patients' quality of life and psychological state, providing strong support for their overall recovery.

References

[1] Wang Huihui, Chi Juntao. Construction of a Phased Nursing Intervention Protocol for Patients Undergoing Radiofrequency Catheter Ablation of Atrial Fibrillation[J]. Contemporary Medical Symposium, 2026,24(1):145-148.

[2] Li Yizheng, Huang Lili, Ma Shanshan, et al. Effect of standardized rehabilitation nursing intervention combined with radiofrequency ablation in patients with atrial fibrillation[J]. Journal of Aerospace Medicine, 2025,36(6):763-765.

[3] Wang Liang, Jiang Xiaoyan, Wang Xuan, et al. Development and Application of a Health Intervention Program Based on the Green Model for Patients After Catheter Radiofrequency Ablation of Atrial Fibrillation[J]. Practical Journal of Clinical Medicine, 2024,21(3):151-155.

[4] Wang Ying, Wang Bin. Effect of refined nursing intervention in operating room on psychological status, comfort, and nursing quality in patients undergoing radiofrequency ablation for atrial fibrillation[J]. Heilongjiang Medical Science, 2025, 48(11): 170-172.

[5] Zhao C Y, Zeng L X, Qiang H, et al. Study on the effects of early postural intervention and ambulation in patients with atrial fibrillation after radiofrequency ablation[J]. Chinese General Practice Nursing, 2024,22(5):929-932.