MEDS Public Health and Preventive Medicine (2024)
Clausius Scientific Press, Canada

DOI: 10.23977/phpm.2024.040207
ISSN 2616-1915 Vol. 4 Num. 2

Impact of Comprehensive Nursing Intervention on Rehabilitation Adherence, Nursing Satisfaction, and Quality of Life in Patients with Chronic Heart Failure

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Keywords: Chronic heart failure, comprehensive nursing intervention, quality of life, nursing satisfaction, 5E nursing model, clinical nursing

Abstract: This study aimed to evaluate the impact of comprehensive nursing intervention on the quality of life and nursing satisfaction in patients with chronic heart failure (CHF), exploring the value of a more holistic care model in chronic disease management. 172 CHF patients were randomly assigned to a control group and an observation group, with 86 patients in each group, followed up for 12 weeks. The control group received standard care, while the observation group received comprehensive nursing intervention based on the "5E" holistic nursing model. Primary outcomes were quality of life (Minnesota Living with Heart Failure Questionnaire, MLHFQ) and nursing satisfaction. Quality of life in the observation group significantly improved, with MLHFQ scores decreasing from 52.24 at baseline to 44.20, compared to a slight decrease in the control group from 49.95 to 48.62 (p=0.001). In terms of nursing satisfaction, the observation group had 31.40% of patients "very satisfied" and 45.35% "satisfied," significantly higher than the control group's 10.47% and 29.07%, respectively (p<0.0001). Comprehensive nursing intervention significantly enhanced the quality of life and nursing satisfaction in CHF patients, confirming its value in clinical practice. It is recommended to incorporate comprehensive nursing intervention into standard CHF care processes to optimize treatment outcomes and quality of life.

1. Introduction

Chronic heart failure (CHF) is a major public health issue worldwide, representing the final stage of heart disease progression. It affects over 26 million people globally, with incidence rates rising due to an aging population [1]. CHF patients often exhibit severe limitations in cardiac filling and ejection, affecting multiple body systems. Common symptoms include extreme fatigue, dyspnea, and reduced exercise tolerance, significantly limiting daily activities and quality of life [2].

Despite recent advancements in drug treatments and management strategies for heart failure, such as diuretics, ACE inhibitors, and β-blockers, managing CHF remains challenging [3]. In addition to pharmacotherapy, managing heart failure requires lifestyle adjustments and regular cardiac function monitoring [4]. Traditional nursing methods often focus on biomedical management, lacking in meeting patients' individual needs, providing ongoing education, and offering psychological and

emotional support [5].

Long-term management of CHF involves complex medication adjustments and self-management capabilities, requiring patients to have a certain level of health knowledge and management skills. In this context, the lack of effective education and support can lead to poor adherence, negatively impacting treatment outcomes and prognosis [6]. Therefore, this study adopted a comprehensive nursing intervention strategy, covering traditional clinical care needs and enhancing patient education, psychological support, and lifestyle guidance, with a particular emphasis on patient and family involvement to improve rehabilitation adherence, quality of life, and overall nursing satisfaction [7].

By introducing comprehensive nursing intervention, this study aimed to explore its effectiveness in improving rehabilitation adherence, quality of life, and nursing satisfaction in CHF patients, thereby providing a more complete and supportive care strategy for clinical practice. The ultimate goal of this approach is to reduce symptoms and improve quality of life by enhancing overall patient management, providing a more supportive treatment environment.

2. Methods

2.1 Study Design

This study was a single-center, prospective randomized controlled trial conducted between January 2023 March 2024 at a large tertiary hospital. A total of 172 CHF patients were randomly assigned to either the experimental group or the control group in a 1:1 ratio, with 86 patients in each group. The experimental group received routine care combined with the "5E" comprehensive nursing model and other integrated nursing interventions, while the control group received routine care. All participants were followed up for 12 weeks to assess rehabilitation adherence, quality of life, and nursing satisfaction. Written informed consent was obtained from all participants, and the study was approved by the hospital's ethics committee.

2.2 Nursing Interventions

Nursing interventions in this study were divided into routine care and comprehensive nursing interventions.

2.2.1 Routine Care

①Routine Care Patients in the control group received the following routine care:

②Basic Medication Therapy: Based on current heart failure treatment guidelines, including ACE inhibitors, β-blockers, diuretics, and cardiac glycosides to control symptoms and slow disease progression.

③Physiological Monitoring: Regular monitoring of heart rate, blood pressure, respiratory function, and fluid status, with adjustments to treatment plans as needed.

④Patient Education: Providing basic disease knowledge education and teaching patients how to recognize signs of worsening conditions (e.g., dyspnea, rapid weight gain).

2.2.2 Comprehensive Nursing Interventions ("5E" Model) Patients in the observation group received the following additional comprehensive nursing interventions:

①**Health Education:** Personalized Educational Content: Using multimedia materials (animated videos, pamphlets) and one-on-one teaching based on patients' cognitive abilities and cultural backgrounds, covering disease management, medication use, and symptom monitoring.

②**Family Involvement:** Encouraging family members to participate in the education process to enhance the support system.

③**Nutrition and Exercise Guidance**

- Diet Plan: Creating low-salt, low-fat diets tailored to patients' specific conditions by a nutritionist to control fluid intake and prevent fluid retention.
- Exercise Program: Developing individualized, progressive exercise plans based on patients' cardiac function and physical condition, such as walking and water-based exercises, aiming to improve cardiopulmonary endurance and overall fitness.

④**Psychological Support**

- Regular Psychological Counseling: Providing regular counseling by professional psychologists to help patients manage anxiety and depression related to the disease.
- Emotional Management and Social Skills Training: Enhancing social interaction and emotional management skills through group therapy or social activities to reduce feelings of social isolation.

⑤**Behavioral Interventions and Health Education:**

- Social Media Support Network: Using social media platforms like WeChat and QQ to create patient support groups for sharing experiences and mutual encouragement.
- Behavioral Incentives: Regularly posting health challenges and goals on social media to motivate patients to maintain healthy habits, such as taking medications on time and exercising regularly.

2.3 Study Metrics

To evaluate the impact of comprehensive nursing interventions on CHF patients, the following study metrics were set:

2.3.1 Quality of Life

Assessed using the Minnesota Living with Heart Failure Questionnaire (MLHFQ), which measures overall quality of life across three domains: physical, emotional, and other. The MLHFQ consists of 21 items, each scored on a 0-5 scale, with higher scores indicating worse quality of life.

2.3.2 Rehabilitation Adherence

Evaluated by patients' adherence to medication, regular follow-ups, dietary and exercise guidance. Verification is done through patient self-reports and medical record checks. Evaluation Criteria:

①**Medication Adherence:** Frequency of medication taken as prescribed, assessed through medication logs and pill box checks.

- "Good adherence": Correct medication intake for over 90% of days.
- "Poor adherence": Correct medication intake for less than 90% of days.

②**Follow-up Adherence:** Number of scheduled follow-ups attended.

- "Good adherence": No missed scheduled follow-ups.
- "Poor adherence": One or more missed scheduled follow-ups.

③Dietary Adherence: Consistency of patient diet logs with nutritionist or doctor-provided dietary plans.

- "Good adherence": Following dietary plans for over 80% of days.
- "Poor adherence": Following dietary plans for less than 80% of days.

④**Exercise Adherence:** Consistency in following exercise plans, tracked via fitness trackers or self-reports.

- "Good adherence": Executing prescribed exercises for over 75% of days.

- "Poor adherence": Executing prescribed exercises for less than 75% of days.

2.3.3 Nursing Satisfaction

Assessed using a customized nursing satisfaction questionnaire evaluating aspects such as response time, quality of care, information delivery, and overall satisfaction.

2.4 Data Collection and Analysis

Data collection tools included the MLHFQ, a self-made follow-up form, and a nursing satisfaction questionnaire. Statistical analysis was conducted using SPSS 25.0 software, with t-tests for continuous variables and x^2 tests for categorical variables, setting the significance level at $P<0.05$.

3. Results

3.1 Demographic Characteristics of the Two Groups

The average age of the observation group was (61.8±9.2) years, and the control group was (62.1±9.5) years. In the observation group, there were 50 males (58.1%) and 36 females (41.9%); in the control group, there were 47 males (54.7%) and 39 females (45.3%). There were no statistically significant differences between the two groups in terms of age and gender composition ($p>0.05$).

Regarding the prevalence of underlying conditions, hypertension was the most common in both groups, with 62 cases in the control group and 58 cases in the observation group, accounting for 72.1% and 68.2%, respectively. The second most common condition was diabetes, with prevalence rates of 60.5% in the control group and 57.0% in the observation group. There were no statistically significant differences between the two groups in the prevalence of underlying conditions. There were no statistically significant differences in the prevalence of hypertension, diabetes, and coronary heart disease between the two groups ($p>0.05$). Table 1.

Table 1: Demographic and Clinical Characteristics of the Two Groups

Variable	Control Group	Observation Group	t/x^2	p
Average Age (years; $\bar{x} \pm s$)	62.1±9.5	61.8±9.2	0.22	0.83
Gender(n;%)				
Male	47(54.7)	50(58.1)	0.01	0.91
Female	39(45.3)	36(31.9)		
conditions (times; n;%)				
Hypertension	62(72.1)	58(68.2)	0.08	0.78
Diabetes	52(60.5)	49(57.0)		
Coronary Heart Disease	47(54.7)	44(51.2)		

Note: The number of comorbidities is counted as the number of comorbidities per person. For example, if a person has both hypertension and diabetes, each disease is recorded once, so the total number and composition ratio are not equal to the total number of people in each group and 100%.

3.2 Comparison of Rehabilitation Compliance Between the Two Groups

The observation group had a higher proportion of patients with good rehabilitation compliance than the control group (86.1% vs 70.9%), and the difference between the two groups was statistically

significant (x^2=4.96,p=0.026). Table 2

Table 2: Comparison of Rehabilitation Compliance Between the Two Groups (n=172;n[%])

Variable	Control Group	Observation Group	x^2	p
Good Compliance	61(70.9)	74(86.1)	4.96	0.026
Insufficient Compliance	25(29.1)	12(13.9)		

3.3 Comparison of Quality of Life Scores Between the Two Groups During Follow-Up

The MLHFQ scores of the observation group decreased significantly after receiving comprehensive nursing intervention, from a mean of 52.24 to 44.20. The scores of the control group decreased slightly during the follow-up period, but the change was not significant. The difference in MLHFQ score changes between the two groups at follow-up was statistically significant (t=3.32, p=0.001).Table 3.

Table 3: Comparison of Quality of Life Scores Between the Two Groups During Follow-Up (n=172)

Variable($\bar{x} \pm s$)	Control Group	Observation Group
Baseline Mean MLHFQ Score	49.9 ±10.4	52.2 ±10.0
Follow-Up Mean MLHFQ Score	48.6 ±9.1	44.2 ±8.3
t	3.32	
p	0.001	

3.4 Comparison of Nursing Satisfaction Between the Two Groups

The intervention group showed higher levels of nursing satisfaction compared to the control group. The proportions of patients who were "very satisfied" and "satisfied" were 31.4% and 45.4% in the intervention group, respectively, which were higher than the 10.5% and 29.1% observed in the control group. The difference in nursing satisfaction between the two groups was statistically significant (χ^2=26.28, p<0.001). Table 4.

Table 4: Comparison of Nursing Satisfaction Between the Two Groups (n=172;n[%])

Variable	Control Group	Observation Group
Very Satisfied	9(10.5)	27(31.4)
Satisfied	25(29.1)	39(45.4)
Neutral	39(45.4)	15(17.4)
Dissatisfied	13(15.1)	5(5.8)
x^2	26.28	
p	<0.0001	

4. Conclusions

This study explored the impact of comprehensive nursing interventions on the quality of life and nursing satisfaction of 172 patients with chronic heart failure through random assignment and 12-week follow-up. The results confirmed the effectiveness of comprehensive nursing interventions, particularly in improving patient satisfaction.

The study showed that patients in the observation group who received the "5E" comprehensive nursing model had significant improvements in their quality of life. The mean MLHFQ score in the observation group decreased from 52.24 at baseline to 44.20, while the control group's score slightly decreased. This improvement was statistically significant (P<0.001). This finding is consistent with the conclusions of Samartzis[8] and Moradi M[9], who also reported that comprehensive nursing interventions significantly improved the quality of life in heart failure patients. This study emphasized the importance of personalized and comprehensive nursing strategies through detailed intervention measures and follow-up evaluations.

In this study, the observation group showed significantly higher satisfaction levels in the "very satisfied" and "satisfied" categories compared to the control group. The chi-square test showed that this difference was statistically significant (P<0.0001). This is similar to the findings of Song[10] and Damluji[11], who noted that nursing satisfaction significantly improved in heart failure patients receiving systematic nursing interventions. This study further enriched the field by demonstrating that comprehensive nursing models can significantly enhance patient satisfaction, particularly in maintaining treatment adherence and promoting healthy behavior changes[12].

This study supports the inclusion of comprehensive nursing interventions as part of the standard care for heart failure patients, consistent with the research by Gomes L[13], which advocated for multidisciplinary approaches in heart failure care, emphasizing education and behavioral interventions. Through specific intervention measures and systematic evaluations, this study further confirmed the crucial role of comprehensive nursing in improving patient outcomes[14].

The findings of this study highlight the importance of comprehensive nursing interventions in the management of chronic heart failure and suggest incorporating such interventions into routine clinical practice to optimize patient outcomes and quality of life. Future research should consider different types and intensities of comprehensive interventions, assessing their impact on managing other chronic diseases, to popularize and refine this nursing model and provide more humanized and effective care services for patients[15].

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