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Application and Promotion of Whole-Process Capacity Management Model for CHF Patients Led by Specialist Nurses in "Heart Failure Center Alliance Unit"

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Abstract

Objective: To implement the whole-process capacity management model led by specialist nurses, improve the capacity management behavior of medical staff, and build a standardized, standardized and operable CHF capacity management system. **Methods:** According to the evidence pyramid principle and search strategy, 2 evidence-based nursing backbone completed literature search in both Chinese and English, and finally included 7 literatures. **Results:** Around the three key links of capacity assessment, monitoring and management, stakeholders were invited to evaluate each evidence according to the FAME principle, that is, the feasibility, suitability, effectiveness and clinical significance of evidence. Finally, 11 best evidences were obtained and 5 clinical review indicators of the cost project were transformed. This study formulated the competence management plan for CHF patients based on the current situation, established competence load evaluation criteria for CHF patients, and determined the target "dry weight" value for CHF patients. **Conclusion:** The whole-course volume management model of CHF patients guided by specialist nurses should be established and applied and promoted in the "heart failure Center Alliance unit", so as to improve the capacity management ability of medical staff for CHF patients, enhance the self-management ability of CHF patients, improve the capacity management behavior and health outcomes, and effectively reduce the hospitalization rate and mortality rate of CHF patients in the region.

Keywords

Chronic Heart Failure, Volume Management, Evidence-Based Nursing, Specialist Nurses

1. Introduction

Chronic Heart Failure (CHF) refers to the syndrome of excessive heart load, resulting in heart pumping dysfunction, blood stasis in the veins and lack of blood perfusion in the arteries, causing heart blood circulation disorders, and then leading to a series of clinical symptoms. Chronic heart failure (CHF) with its high morbidity, mortality and readmission rate has become a major public health problem in the world. Capacity overload is a major cause of exacerbation of heart failure. To achieve the optimal volume balance state and maintain "dry body mass" in CHF patients is the key step of treatment. However, the volume status of CHF patients is complex and dynamic, and they lack the capacity of self-volume management, especially in the aspects of daily intake restriction and fluid retention monitoring. However, there is a big gap between the actual work evidence and clinical practice of volume management, and it is not fully implemented based on scientific evidence. As the leading unit of heart failure Center in Jingzhou City, our hospital undertakes 13 surrounding regional cooperative institutions to form a heart failure diagnosis and treatment network system. Therefore, in order to standardize the capacity management behavior, it is imperative to explore and build an effective working mode of CHF capacity management, solve the problem of irregular capacity management, and improve the health outcomes of CHF patients as much as possible [1]. Therefore, this study integrated relevant domestic and foreign guidelines, expert consensus and other evidence on capacity management, to provide a reference for the whole-process capacity management mode of CHF patients led by specialist nurses in clinical practice.

2. Data and Methods

2.1. Search Strategy

2.1.1. Using PIPOST to Establish Evidence-Based Issues

Study subjects: patients with chronic heart failure with cardiac function II to grade; intervention: body quality monitoring/tool application/sodium guidance/drug guidance/follow-up management; professionals: specialist nurses, doctors; study outcome: dry body quality compliance rate/readmission rate/medical care; evidence application: cardiology ward; evidence type: clinical practice guidelines, expert consensus. According to the principle of evidence pyramid, the relevant literature of heart failure volume management was reviewed and analyzed, and the search period was not completed until March 1, 2022. The databases of CNKI (CNKI), Wanfang, VIP (VIP) and Chinese biomedical literature (CBM) were searched; use "heart failure/chronic heart failure/congestive heart failure/cardiac insufficiency/cardiac dysfunction", "volume management/capacity management/ volume overloaded/fluid management/fluid overloaded/fluid retention", "congestion symptoms/output and input/weight/body edema/body fluid/sodium/diuretic" Search terms in Both Chinese and English, the CNKI (CNKI), Wanfang, VIP (VIP) and Chinese Biomedical Literature (CBM) databases; the

PubMed, Embase, Web of Science, and Cochrane Library databases were searched.

2.1.2. Documenting Exclusion Standard

Inclusion criteria for literature on volume management of chronic heart failure: 1) Study subjects for patients with chronic heart failure; 2) literature type for guidelines, consensus, RCT and other interventional studies; 3) intervention content included specific measures for volume management. Literature exclusion criteria: 1) repeatedly published literature; 2) cannot obtain the full text of the literature; 3) literature language is not Chinese or English.

2.2. Obtaining Evidence and Constructing Review Indicators

PIPOST method was adopted to establish evidence-based questions: according to the evidence pyramid principle and search strategy, 2 evidence-based nursing backbones completed literature search in both Chinese and English, and finally included 7 literatures (see Table 1), including 4 guidelines and 3 expert consensus (see Table 2 and Table 3), Summarize on the top 20 pieces of evidence (see Table 4). Focusing on the three key links of capacity assessment, monitoring and management, stakeholders were invited to evaluate each piece of evidence according to the FAME principle, that is, the feasibility, suitability, effectiveness

Table 1. General characteristics of the included literatures (n = 7).

Included in the literature	source of evidence	Type of evidence	theme	Date of publication (years)
Ponikowski *et al.* [1]	ESC	Guidelines	Diagnosis and treatment of acute and chronic heart failure	In 2016
Chinese Medical Association, *et al.* [2]	CNKI	Guidelines	Guidelines for the primary diagnosis and treatment of chronic heart failure	In 2019
Heart Failure Group of Cardiovascular Disease Branch of Chinese Medical Association [3]	CNKI	Guidelines	Diagnosis and treatment of heart failure in China	In 2018
And Ezekowitz *et al.* [4]	The Cardiovascular Society of Canada	Guidelines	Management of heart failure	In 2016
Cardiovascular Disease Professional Committee of Chinese Society of Integrated Chinese and Western Medicine [5]	CNKI	Specialist consensus	Chronic heart failure of integrated traditional Chinese and western medicine diagnosis and treatment expert consensus	In 2016
Heart failure Professional Committee of the Chinese Medical Doctor Association, *et al.* [6]	CNKI	Specialist consensus	Heart failure capacity management Chinese experts suggest	In 2018
Jaarsma *et al.* [7]	PubMed	Specialist consensus	Practice recommendations for self-management of patients with heart failure	In 2021

Table 2. Quality evaluation results of the included guidelines (n = 4).

Included in the literature	Standardized percentage of each domain (%)						Comprehensive evaluation 1	Comprehensive evaluation 2	Recommended grade
	scope purpose	concern personnel	developed preciseness	Presented clarity	usability	The compilation of independent character			
And Ponikowski *et al.* [1]	85.23	61.23	72.15	66.23	75.23	92.36	5.0	5.5	A
Chinese Medical Association, *et al.* [2]	65.23	85.36	74.52	69.25	85.42	84.25	5.0	5.0	B
Heart failure Professional Committee of the Chinese Medical Doctor Association, *et al.* [3]	74.52	81.23	85.63	78.63	65.22	75.26	6.0	6.5	B
And Ezekowitz *et al.* [4]	69.65	75.26	85.26	75.78	89.65	95.26	6.5	6.5	A

Table 3. Quality evaluation results including expert consensus (n = 3).

Included in the literature	(1)	(2)	(3)	(4)	(5)	(6)
Cardiovascular Disease Professional Committee of Chinese Society of Integrated Chinese and Western Medicine and Cardiovascular Disease Expert Committee of Integrated Chinese and Western Medicine Branch of Chinese Medical Doctor Association [5]	NO	yes	yes	yes	yes	yes
Heart failure Professional Committee of the Chinese Medical Doctor Association [6]	NO	yes	yes	yes	yes	yes
Jaarsma class [7]	yes	yes	yes	yes	yes	yes

Note: (1) Is the source of the opinion clearly marked? (2) Does the opinion come from an influential expert in the field? (3) Is the proposed view to study the relevant person Group interest-centered? (4) Is the conclusion as stated based on the results of the analysis? Is the expression of ideas logical? (5) Do you refer to the other existing literature? (6) Is there any inconsistency between the proposed views and the previous literature?

Table 4. Summary of evidence on volume management in patients with chronic heart failure.

content of evidence	The evidence level	Recommended level
1. It is suggested to set up a multidisciplinary team of heart failure volume management, including cardiology specialists, cardiovascular specialist nurses, general practitioners, pharmacists, dietitians, rehabilitation therapists, psychologists, social workers, case managers, information engineers, family caregivers, *et al.* [2].	IIIa	A
2. HF multidisciplinary programs reduce readmissions by targeting some known risk factors as well as patient-related behavioral factors.	IIIa	B
3. Multi-disciplinary team cooperation for patients with chronic patients should include: attending doctors who have received specialized training in heart failure patients, specialized nurses, and healthcare professionals with professional knowledge of heart failure prescription.	IIIb	B
4. Volume management scheme can effectively reduce the readmission rate of patients, stabilize the condition, and improve the prognosis of patients [3].	Ib	A
5. Educational programs involved in a multidisciplinary team can improve the treatment dependence and self-care ability of chronic NAD patients and caregivers [3].	Ib	B

Continued

6. Educate patients to self-manage diuretic and fluid intake, and monitor body quality and urine volume. If the body mass is found to increase continuously (such as 2 kg on 3 days), it indicates that the volume overload urine capacity and body mass can directly reflect the changes of the condition, identify the symptoms of heart failure and the manifestations of acute aggravation, and go to the hospital as soon as possible.	Ia	A
7. It is recommended to guide patients to independently judge the symptoms/signs of heart failure, and initially assess their home volume status during the vulnerable period. Typical symptoms include pulmonary congestion symptoms, congestion symptoms of systemic circulation and increased fatigue, decreased activity endurance, increase of resting heart rate by 15 times/min, significant increase in body mass, abnormal urine volume, etc.	IIIa	B
8. Health education for patients and chronic heart failure caregivers to improve treatment dependence and self-care can help improve patients' quality of life [4].	IIa	B
9. Health education of CHF patients and caregivers can improve their quality of life and physical and mental health.	IIIb	B
10. The most critical clinical treatment strategy is to effectively correct volume overload and relieve the symptoms of congestion in the systemic and pulmonary circulation.	IIa	B
11. It is necessary to dynamically evaluate the capacity management status, and change the capacity management objectives in time [5] [6].	Ia	A
12. Patients with chronic heart failure can control fluid intake at 1.5 - 2.0 L/d, or set fluid intake according to body mass. The daily fluid intake of patients with body mass < 85 kg is 30 mL/kg, and those with body mass > 85 kg is 35 mL/kg.	IIa	A
13. Avoid adding excessive salt and seasoning sauce when cooking, such as soy sauce, chili sauce, pickled meat, hanging noodles, pickles, biscuits, etc.	IIa	B
14. Formulate individualized self-volume management measures and goals suitable for the patient according to the comprehensive situation of the patient's dietary status and personal self-care ability.	IIb	A
16. When the volume is overloaded or insufficient, patients should control the fluid intake under the guidance of nurses by telephone, wechat and outpatient service, and adjust the diuretic dose under the guidance of doctors.	IIIa	B
17, patients with chronic heart failure should use diuretics in the early stage of fluid retention. Usually from small dose application, gradually increase the dose to congestion symptoms and signs, for disease control (lung rale disappear, edema subsided, the body mass stability), namely with the minimum effective amount of long-term maintenance, and according to the dose at any time, the goal is to maintain the lowest effective diuretic dose "dry body mass".	IIa	A
18. A heart failure follow-up system should be established to conduct structured telephone follow-up and non-invasive remote monitoring for home-based CHF patients [7].	IIb	B
19. Telephone follow-up is recommended within 3 days after discharge and home visit within 7 - 10 days.	Ib	B
20. Establish a follow-up system for heart failure. The follow-up is recommended once every 2 weeks, and the follow-up is adjusted for 1 - 2 months after the condition is stable.	IIIa	B

and clinical significance of evidence (see Table 5). Finally, 11 best pieces of evidence were obtained (see Table 6) and 5 clinical review indicators of cost projects were transformed (see Table 7).

Table 5. FAME structure.

content of evidence	feasibility	The suitability	Clinical significance	availability
1. Multi-disciplinary team cooperation for patients with chronic patients should include: attending doctors who have received specialized training in heart failure patients, specialized nurses, and healthcare professionals with professional knowledge of heart failure prescription.	✓	✓	✓	✓
2. Educational programs participated by a multidisciplinary team can improve the treatment dependence and self-care ability of chronic NAD patients and caregivers.	✓	✓	✓	✓
3. Educate patients to self-manage diuretic and fluid intake, and monitor body quality and urine volume. If the body mass is found to increase continuously (such as 2 kg on 3 days), it indicates that the volume overload urine capacity and body mass can directly reflect the changes of the condition, identify the symptoms of heart failure and the manifestations of acute aggravation, and go to the hospital as soon as possible.	✓	✓	✓	✓
4. Health education for patients and chronic heart failure caregivers to improve treatment dependence and self-care can help improve patients' quality of life [4].	✓	✓	✓	✓
5. Health education of CHF patients and caregivers can improve their quality of life and physical and mental health.	✓	✓	✓	✓
6. It is necessary to dynamically evaluate the capacity management status, and change the capacity management objectives in time [5] [6].	✓	✓	✓	✓
7. Patients with chronic stage D heart failure can control fluid intake at 1.5 - 2.0 L/d, or set fluid intake according to body mass. Daily fluid intake for patients with <85 kg body mass is 30 mL/kg, and body mass > 85 kg is 35 mL/kg per mouth.	✓	✓	✓	✓
8. Avoid adding excessive salt and seasoning sauce when cooking, such as soy sauce, chili sauce, pickled meat, hanging noodles, pickles, biscuits.	✓	✓	✓	✓
9. patients with chronic heart failure should use diuretics in the early stage of fluid retention. Usually from small dose application, gradually increase the dose to congestion symptoms and signs, for disease control (lung rale disappear, edema subsided, the body mass stability), namely with the minimum effective amount for a long time, and according to the dose at any time, the goal is to maintain the lowest effective diuretic dose "dry body mass".	✓	✓	✓	✓
10. A heart failure follow-up system should be established to conduct structured telephone follow-up and non-invasive remote monitoring for home-based CHF patients [7].	✓	✓	✓	✓
11. Establish a follow-up system for heart failure. Recommend follow-up once every 2 weeks, and adjust to follow-up once every 1 - 2 months after the condition is stable.	✓	✓	✓	✓

2.3. Baseline Review

Indicator 1: The survey on nurses' knowledge of capacity management was carried out based on the questionnaire on knowledge, trust and practice developed

Table 6. Summary of the best evidence for volume management in patients with chronic heart failure.

class	content of evidence	The evidence level	Recommended level
Multidisciplinary teamwork	1. Multidisciplinary teamwork in chronic heart distress patients should include: attending doctors with specialist heart failure training, heart distress specialist nurses, and healthcare professionals with expertise in prescribing heart failure specialists.	IIIa	B
	2. Educational programs involving multidisciplinary teams can improve treatment dependency and self-care capacity among patients with chronic cardiac distress and caregivers.	Ib	B
Health education	3. Patients were educated to self-manage diuretic and fluid intake and to monitor body quality and urine volume. If the body mass is found to increase continuously (such as 2 kg on 3 days), it indicates that the volume overload urine capacity and body mass can directly reflect the changes of the condition, identify the symptoms of heart failure and the manifestations of acute aggravation, and go to the hospital as soon as possible.	Ia	A
	4. Health education for patients and caregivers with chronic heart failure to improve treatment dependence and self-care can help to improve patient quality of life [4].	IIa	B
Capacity management measures	5. Health education for CHF patients and caregivers may improve their quality of life and physical and mental well-being.	IIb	B
	6. It is necessary to dynamically evaluate the capacity management status and change the capacity management objectives in time [5] [6].	Ia	A
	7. Patients with chronic stage D heart failure can control their fluid intake at 1.5 - 2.0 L/d or set fluid intake based on body mass at 30 mL/kg for patients with body mass < 85 kg and 35 mL/kg for patients with body mass > 85 kg/mouth.	IIa	A
	8. Avoid excessive salt and sauces, such as soy sauce, chili sauce, pickled meat, noodles, pickles, biscuits, etc.	IIa	B
	9. Patients with chronic heart failure should use diuretics in the early stages of fluid retention. Usually from small dose application, gradually increase the dose to congestion symptoms and signs, for disease control (lung rale disappear, edema subsided, the body mass stability), namely with the minimum effective amount for a long time, and according to the dose at any time, the goal is to maintain the lowest effective diuretic dose "dry body mass".	IIa	A
Follow-up	10. A heart failure follow-up system should be established to provide structured telephone follow-up and non-invasive remote monitoring for home-based CHF patients [7].	IIb	B
	11. Establish a follow-up system for heart failure. Recommend follow-up once every 2 weeks, and adjust to follow-up once every 1 - 2 months after the condition is stable.	IIIa	B

based on Delphi method, with 51 items in 3 dimensions and 18 nurses; Indicator 2: Patients (or caregivers) were informed of capacity management related education; Indicator 3: Body mass monitoring was carried out and the results were

Table 7. Reviews indicators.

Review indicators	Sample book	Review method
Index 1 Nurses have mastered the relevant knowledge of capacity management	Eighteen nurses	Questionnaire star assessment, morning meeting questions
Index 2 Patients (or caregivers) were informed about the education on volume management	There were 152 patients	Review patient files
Index 3 Conduct the body quality monitoring and record the results, and implement the capacity management protocol	There were 152 patients	On-site observation, medical system, and access to clinical pathway care records
Index 4 The department has standardized multidisciplinary team diagnosis and treatment system	28 Medical care	Review department documents
Index 5 The department has a standardized heart failure follow-up system process and implementation	28 Medical care	Review department documents

recorded, standardized procedures were determined, and capacity management plans were implemented. 152 patients were observed on site, department files and mobile medical workstations were consulted and checked; Indicator 4: departments have standardized multidisciplinary team diagnosis and treatment system process and implementation; Indicator 5: Departments have standardized heart failure follow-up system and procedures, 28 medical staff to review department documents. Identify obstacles and construct action strategies (see Table 8).

2.4. Analyzing Obstacles and Constructing Action Strategies

2.4.1. Obstacle Factors 1

There is no capacity management working mechanism

Action strategies: Establish a working mechanism 1) Establish a working mechanism, form an MDT team led by specialist nurses, and clarify work responsibilities and intervention opportunities. 2) Establish a working mode of capacity management, which includes the collection of admission health information, the assessment of in-hospital capacity status, the determination of management objectives, the formulation of management plans, and the follow-up of discharge and out-of-hospital services. 3) From the five dimensions of assessment, measures, health education, management objectives, and result evaluation, the clinical path was developed to run through the whole cycle of heart failure patient management. 4) There are plans to organize the best evidence training and assessment in the department to ensure the training effect.

2.4.2. Obstacle Factors 2

Lack of quantifiable measuring tools for body mass, water and salt measurement, and do not monitor related indicators

Action strategy: indicator monitoring. 1) For body mass monitoring, specialist nurses guide patients to weigh and record at a fixed time and under the same conditions every day; Through the grading table of pitted edema, the patient

Table 8. List of obstacle factors and action strategies.

Obstacle Factors	Countermeasure groups	Games
No capacity management working mechanism	Countermeasure 1: Establish CHF whole capacity management mechanism	1) MDT 2) working mode of whole-process capacity management 3) Formulation of clinical pathway 4) training and assessment
There is a lack of quantifiable tools for measuring body mass and water and salt, and the relevant indicators are not monitored	Countermeasure 2: Using quantifiable tools for indicator monitoring	1) Body mass monitoring 2) inlet and outlet monitoring 3) sodium salt guidance
Lack of specific drug guidance for CHF patients	Countermeasure 3: Standardize the monitoring item index and frequency in the use of special drugs	1) Drug monitoring platform 2) Drug guidance 3) Timed medicine box
No individualized health education program	Countermeasure 4: Multi-approach individualized health education program	1) Self-management manual 2) Lecture on capacity management 3) Self-care ability improvement guidance 4) Guidance on relieving thirst symptoms
There is a lack of supervision system for patients to return to their families after discharge	Countermeasure five: Carry out volume management follow-up	1) Establish electronic archives 2) Develop follow-up procedures 3) Extended care outside the hospital

was taught to identify the method of early volume abnormality; Set observation items and frequency according to medical goals; According to the patient's condition, set 24 h fluid intake and outflow amount. 2) For the monitoring of the amount of fluid in and out, guide the patient to use quantitative tools, and compare the conversion table, accurately control the amount of fluid in and out and record it to avoid capacity overload. 3) For sodium salt intake, nutritionists rely on nutritional diagnosis and treatment system, nutritional assessment of patients, start individualized food "traffic light" program, the red light is mainly high salt content of food, prohibited eating; The green light is mainly for food with low salt content, recommended eating; Use visual weight and salt ration bottle, compare salt consumption scale and sodium salt conversion formula, limit sodium salt intake of patients.

2.4.3. Obstacle Factors 3

Lack of special medication guidance for CHF patients

Action strategy: Drug guidance. Clinical pharmacists can determine the rationality of the use of diuretics and the rate of drug target dose compliance through the evaluation of drug monitoring platform and patient signs to ensure drug efficacy. According to the types of special drugs, the corresponding biochemical indicators and signs were monitored. And recommend patients to use timed pill box, timed dose.

2.4.4. Obstacle Factors 4

There is no individualized health education program

Action strategy: individualized health education. 1) Develop self-management guidance manual, regularly carry out special lectures on volume management,

and specialist nurses give guidance on self-care ability to tube bed patients twice a week to improve patients' self-volume management ability. 2) For patients with heart failure with thirst, the degree of thirst was assessed according to visual analog score, and the patients were instructed to relieve thirst by taking ice cubes, chewing sugar-free gum or drinking lemonade.

2.4.5. Obstacle Factors 5

Lack of supervision system for patients returning to their families after discharge

Action strategy: Conduct volume management follow-up. 1) Establish personal capacity management electronic files, and develop follow-up and follow-up management procedures. 2) According to the effect of patient volume management, determine the frequency and form of follow-up. One to one online guidance for those with better management effect; For those with poor compliance, make an appointment in advance and arrange specialist nurses for home visits; For those with poor management effect or symptoms of capacity overload, it is required to go to the local hospital or the heart failure clinic of our hospital in time.

3. Promotion and Application

1) Form a whole-process capacity management model for CHF patients led by specialist nurses, and carry out radiation promotion in Southwest Hubei Union region as the center. At present, it has guided 2 cooperating hospitals to establish grassroots version of heart failure center, and provided standardized capacity management training and guidance to 23 nurses and more than 100 patients. It is planned to complete the promotion and application of the remaining 10 alliance units by 2024.

2) Combined with the "323" key action, joint multi-departments to carry out grassroots activities. Organize 8 special training activities, 88 expert consultations, 6 free screening activities, and select 2 medical cadres to serve at the grassroots level for half a year to solve the problems of early diagnosis, early prevention, early screening and early treatment of CHF patients.

4. Effective Quality Control and Continuous Improvement

1) Set up a quality control team with head nurse and specialist nurses as the core; Set up a special assessment scale to assess the work implementation rate.

2) The specialist indicators are included in the monitoring and management, the specialist nurses make weekly analysis and tracking evaluation, the head nurse summarizes the inspection results every month, analyzes the reasons for several unqualified items, optimizes the strategy in time, and ensures the effective implementation of the program.

5. Effect Evaluation

SPSS25 was used for statistical analysis of the data, and the related indicators of cardiac function, patients' self-care ability, and the scores of medical staff's CHF

patients' capacity management knowledge before and after the use of the syndrome were statistically analyzed.

5.1. Patient Level

There were significant differences in LVEF and self-care ability of patients before and after treatment ($p < 0.05$). In terms of volume management indicators, the dry-body mass compliance rate was increased from 40.1% to 64.4%, while the read hospital admission rate and BNP value had no significant difference ($p > 0.05$) (see Tables 9-11).

5.2. Hospital Level

1) The scores of doctors' and nurses' attitude towards volume management increased from 10 to 18, knowledge from 32 to 55, and behavior from 9 to 16 (all $p < 0.05$) (see Table 12).

2) Re-examination of the review indicators after the application of evidence: 174 patients admitted from June to October 2021 were used as the trial group for the second round of baseline review, and the results showed that all 5 indicators were improved (see Figure 1).

Table 9. Comparison of cardiac function related indicators in CHF patients before and after the application of evidence.

Groups	Number of cases	EF difference	BNP difference
Before evidence is applied	152	7.98 ± 8.568	255.33 ± 469.028
Evidence after application	174	4.31 ± 7.835	−329 ± 464.172
t		4.014	1.430
P		<0.001	0.153

Table 10. Comparison of indicators of volume management in CHF patients before and after evidence application.

Groups	Number of cases	Readmission rate (%)	Dry body mass compliance rate (%)
Before evidence is applied	152	5 (3.28)	61 (40.1)
Postapplication of evidence	174	4 (2.3)	112 (64.4)
X^2		0.042	10.243
P		>0.05	0.001

Table 11. Comparison of self-care ability in CHF patients before and after evidence application.

Groups	Number of cases	Total MLHFQ Scale score
Before Evidence is applied	152	62.15 ± 3.005
Evidence after application	174	22.08 ± 1.671
t		15.406
P		<0.001

Table 12. Comparison of knowledge scores of CHF patients before and after evidence application.

Groups	Number of cases	Attitude (20 points)	Knowledge (60 points)	Behavior (20 points)
Preapplication of evidence	30	10 ± 3.69	32 ± 1.16	9 ± 1.48
Evidence after application	30	18 ± 2.88	55 ± 7.17	16 ± 4.31
t		3.7219	2.1509	3.1582
P		0.000	0.0013	0.0000
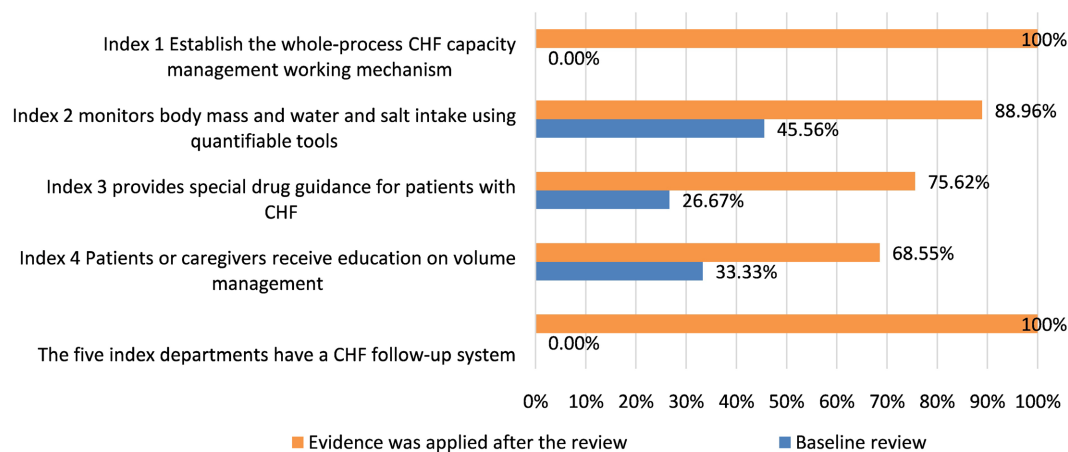
Figure 1. Post-application review of evidence.

5.3. Social Dimension

Formulation and practice of volume management plan for patients with chronic heart failure.

1) As a unit of the heart failure Center alliance, promote the capacity management program to the radiated medical institutions, and update the concept through training.

2) To carry out special training for hospitals in the Alliance area, organize provincial and municipal continuing education training courses, expert consultation, free clinic screening activities, help cooperative hospitals to establish heart failure centers, send medical backbone grass-roots services, and expand the use of syndrome nursing.

6. Discussion

6.1. The Whole-Course Volume Management Mode of CHF Patients Led by Specialized Nurses Can Improve Patient Cardiac Function

Cardiac ultrasound examination can judge the functions of the heart, LVEF value is the reflection of cardiac systolic function, LVEF normal value in 50% - 70%, the increase of LVEF value indicates that the heart failure symptoms are improved [8]. After the application of evidence, the difference of LVEF was lower than before the application of evidence, this study made patients realize the

importance of volume management by correcting previous management errors through face-to-face demonstration, one-to-one guidance, providing management tools to better master the volume management method, more accurately assess their own fluid retention, reduce the risk of volume overload, and have a certain positive impact on their heart contraction function [9]. BNP is important for the diagnosis of heart failure, differentiation of cardiac function, and prognosis, and is positively correlated with the severity of heart failure [10]. The results of this study showed that the difference in BNP between the two groups before and after the evidence application was not significant, which contradicted the study results of Ni Jian [11] and Chen Hua [12]. The analysis reason may be that the intervention time in this study was one month, which should be extended to 3 months to further observe the changes of plasma BNP concentration in CHF patients.

6.2. The Whole-Process Volume Management Mode of CHF Patients Led by Specialized Nurses Can Effectively Reduce the Patient Readmission Rate

Hospital-discharge readmission rates in elderly patients with chronic HF remained high, with up to 20% within 1 month. The readmission rate within 3 months after discharge can be as high as 30%, and the risk of all-cause death is significantly increased by 4 to 6 times [13] compared with patients not hospitalized with heart failure. During rehospitalization, the cardiac function will show progressive decline, and the congestion symptoms will be more serious. The results of the study readmission rate showed a significant difference between the two groups in March after discharge ($p < 0.05$), consistent with the results of Lin Li [14] and Jiang Y [15] *et al.*, patients with this model could establish and maintain volume management behavior, thus exerting the significant effect of volume management in reducing the readmission rate of patients with heart failure.

6.3. The Whole-Process Volume Management Mode of CHF Patients Led by Specialized Nurses Can Improve the Dry Body Quality Compliance Rate of Patients

The main reason for frequent hospitalization in patients with heart failure is volume overload, and dry body mass refers to the body mass of patients with heart failure without the symptoms and signs of congestion. In this study, the body mass on the day of discharge was used as the reference standard of dry body mass [16]. In the control group of this study, most of the patients were obviously volume overload, and those who failed to meet the standard after discharge before evidence application.

6.4. The Whole-Process Volume Management Mode of CHF Patients Led by Specialized Nurses Can Improve the Quality of Life of Patients

Patients with chronic heart failure generally have fatigue, fatigue dyspnea and

edema and other physical symptoms, some patients. It will also be accompanied by psychological symptoms such as anxiety, depression and other psychological symptoms, which significantly reduce the quality of life of patients [17], and low quality of life is associated with the number of readmissions of patients with chronic HF, which will significantly increase the risk of death, which can be used to predict the prognosis of patients [18]. The higher the MLHFQ score represents the worse quality of life, the score after the evidence application was lower than before the evidence application and the difference was significant, and the representative pattern has a significant effect on the improvement of short-term quality of life of patients in the intervention group.

7. Summary of the Effect

7.1. For Patients

The evidence-based capacity management scheme for CHF patients can significantly improve the self-care ability of patients and their caregivers, reduce the risk of capacity overload, improve the quality of life of patients, and promote the post-hospital rehabilitation effect of CHF patients.

7.2. For Medical Service Providers

Improve the cognition, teamwork spirit, evidence-based ability and scientific research quality of medical staff on capacity management of CHF patients.

7.3. For Hospitals

1) Focus on clinical hot spots and difficult problems, and apply the latest and best evidence to chronic heart failure volume management; 2) The outcome indicators involved in improving the volume management behavior and health outcomes focus on the current national cardiovascular quality control index 1 and nursing quality control index 2; 3) The concept radiates from the hospital to the outside, and is promoted to 13 medical institutions in northwest Hubei, forming a certain influence at the city and county level.

7.4. Social Effect

1) Passed the certification of "Heart Failure Center" in 2021, actively promoted the linkage up and down, graded diagnosis and treatment, and established the CHF capacity management network medical link system. The capacity management has covered 13 prefecty-level network medical link systems such as Songzi, Jianli, public security, Shishou, a number of community service stations and township health centers around the region; 2) Since June 2021, a total of more than 879 health records for patients with heart failure have been established to conduct standardized capacity management of them, and improve patients' cognition and self-care ability through four aspects: body quality monitoring, drug intervention, health education and follow-up; Among them, 237 patients were revisited; Two-way referral of 35 patients; And remote consultations 26; 3) Car-

ried out 8 "Heart failure network regional cooperative hospital training meetings"; Held 2 provincial and municipal continuing education training courses "New Progress in Heart failure Diagnosis and Treatment Study Class 06-2022-03-01-008" and municipal continuing education project "New Progress in Cardiovascular Disease basic Hospital Promotion Study Class 2022-03-01-024"; On-site expert consultation, free screening activities 6; 4) Selected key doctors and nurses to conduct center construction and capacity management program guidance training for cooperative hospitals, and 2 cooperative units have passed the certification unit of grassroots heart failure center.

8. Summary

This study constructed a full-process capacity management model for CHF patients guided by specialist nurses. The model was then applied and promoted in the "heart failure center alliance unit" to improve the capacity management ability of medical staff for CHF patients and enhance the self-management ability of CHF patients. This led to improvements in capacity management behavior and health outcomes, effectively reducing the hospitalization and mortality rates of CHF in the region. Due to the dynamic nature of the evidence, the team will continue to pay attention to the update of the evidence, and the next step will be to expand the MDT team with multidisciplinary collaboration, strengthen regional collaboration, promote the implementation of best practices in combination with clinical scenarios, promote the application scope of the model, and truly realize the linkage between the upper and lower levels based on the alliance center, and build a bridge for capacity management.

Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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