DOI: 10.53469/jcmp.2025.07(06).23

Research Progress on the Application of Continuity Care in Patients with Chronic Heart Failure

La Zhen, Ying He*, Guixin Shi, Dingwei Feng

Xizang Minzu University for Nationalities, Xianyang 712046, Shaanxi, China
Correspondence Author

Abstract: ***Chronic Heart Failure (CHF) is a syndrome of cardiovascular insufficiency caused by various cardiovascular diseases. With the acceleration of population aging, its prevalence has increased year by year. It puts huge pressure on the medical system. In the management of patients with chronic heart failure, achieving continuity of care from hospital to community and family will not only help improve the quality of life and prognosis of patients with chronic heart failure, but also alleviate the current shortage of medical resources. Through literature review method, this paper systematically analyzes the application progress of continuity care in patients with chronic heart failure, including its development status, form, content and improvement measures. Research shows that continuity care has significant effects in improving patients' quality of life and prognosis, and its implementation strategies should be further optimized in the future. This article aims to provide reference for the development of continuous care work in patients with chronic heart failure. To promote overall health management of patients.***

Keywords: Continuous care, Chronic heart failure, Chronic condition management, Research progress**.**

1. Introduction

Chronic Heart Failure (CHF) is a heart structure and dysfunction mainly manifested in dyspnea, fatigue and movement disorders. It is the end stage of a variety of cardiovascular diseases and has the characteristics of high incidence, mortality and high rehospitalization rates [1]. At present, the total number of CHF patients worldwide has exceeded 37 million, and my country has reached 8.9 million, of which hospitalized patients over 75 years old account for 50% [2]. And the incidence and prevalence increase with age. Studies have shown that the re-hospitalization rate of CHF patients is 30% within 30-90 days and up to 61.3% in 6 months [3]. Due to the combined effect of factors such as aging population and poor lifestyle, the incidence and prevalence of CHF are expected to continue to increase in the next few decades [4]. It seriously affects the quality of life of patients, reduces their independence and daily living ability, and puts a heavy burden on the patient's medical system and social economy. Therefore, exploring effective CHF management models, especially continuity of care, has become a key measure to improve patient prognosis and reduce rehospital rates slightly.

2. The Emergence and Development of the Concept of Continuity Care

The concept of continuity of care was first proposed in 1947, aiming to ensure continuous and seamless care in different and the same health care facilities through a series of collaborative actions [5]. This concept aims to address the health risks associated with hospitalized patients due to care disruptions after discharge, especially for patients with high demand for chronic diseases and postoperative recovery. In the 1980s, the Transitional Care Model proposed a "transitional care model" with multidisciplinary personnel participating, aiming to establish individualized discharge programs for patients and reduce the risk of readmission during subsequent follow-up. Continuing care has gradually shifted from theory to practice and has gradually developed into a global chronic disease prevention and control strategy. The United States Joint Committee pointed out that continuity care is an extension of in-hospital care to out-of-hospital rehabilitation, especially for patients with CHF who can continue to receive professional care after being discharged from the hospital, reducing their readmission rate, improving patients' prognosis, and produced better economic and social benefits [6]. Therefore, continuity care has become an important strategy for post-discharge management of CHF patients.

3. Current Status of Continuous Care for CHF Patients at Home and Abroad

Foreign countries started early in the field of continuity of care. A variety of mature models have been formed. Currently, the main continuity care models abroad include continuity care intervention model, APN continuity care model, guided care model and elderly resource model [7]. Studies have shown that continuity care can significantly improve the self-care ability, disease cognition level and quality of life of CHF patients, and reduce the rate of read-hospital and mortality [8,9]. However, many foreign groups focus on remote monitoring and interdisciplinary cooperation, and there is insufficient integration of community resources. Since the introduction of the continuity care model in China in 2002, it has been mainly based on the continuous care model of hospital-community-family tripartite linkage, it has achieving significant results in the management of many chronic diseases such as diabetes, chronic kidney disease and COPD [10,11]. In recent years, research on continuous care for patients with CHF has gradually deepened, confirming that continuous care has improved the clinical symptoms of patients with CHF, enhanced overall quality of life and self-care ability, and significantly reduced the rate of rehospitalization [12,13,14]. However, domestic research

mostly focuses on follow-up and community linkage, and lacks exploration of emerging models such as telemedicine and interdisciplinary collaboration, which needs to be further optimized and improved in the future.

4. Continuous Care Form of CHF Patients

4.1 Follow-up

Follow-up is the core form of continuous care for CHF patients. According to the different scenarios and methods of this implementation methods, it can be divided into remote follow-up and outpatient follow-up.

4.1.1 Remote follow-up

Remote follow-up is mainly achieved through telephone, *WeChat* and door-to-door services, and is completed by nursing staff or community medical staff. Its advantages are convenience, low cost, and suitability for long-term management Studies have shown that regular remote follow-up can significantly improve self-efficacy, mental status, and quality of life of CHF patients, and reduce the rate of disease recurrence. through randomized controlled trials that the self-efficacy of patients in the telephone follow-up group was significantly higher than that of the routine nursing group [15]. However, existing research mostly focuses on short-term effects and lacks assessment of long-term effects. In addition, the standardization of follow-up content still needs to be optimized. Future studies need to further explore the impact of different follow-up frequencies, contents and forms on patients' long-term prognosis to meet diverse needs.

4.1.2 Outpatient follow-up

Outpatient follow-up is a formal, organized and continuous form of care provided by the hospital for CHF patients, completed by specialists or nursing staff. Patients need to go to the hospital outpatient clinic regularly for face-to-face diagnosis and health education. study showed that [16] after 12 months of outpatient follow-up intervention, the self-care ability of CHF patients has been significantly improved, and the unplanned readmission rate has been reduced to 5.17%, far lower than the 19.23% rate in the conventional care group. However, outpatient follow-up requires patients to frequently travel to and from the hospital, which is costly. At present, China CHF specialist nursing clinic is still in its infancy and has limited coverage. In the future, it is necessary to strengthen the promotion of outpatient follow-up and explore its synergy with remote follow-up to further improve the long-term prognosis of CHF patients.

4.2 Remote Home Monitoring

Home Remote Monitoring (HRM) is a non-invasive form of remote patient monitoring, which has attracted attention as a promising strategy to improve the care and management of patients with chronic heart failure. Its core purpose is to detect early signs of disease worsening and reduce the incidence of acute events and readmission rates. The use of home-use medical devices to collect and transmit data to patients to receive health reminders is particularly beneficial for residents living in marginal and rural areas, homeless elderly people, frail people, and at high risk of disease worsening [17]. Studies have shown that remote monitoring at home can reduce the risk of hospitalization for all causes and heart failure-related hospitalization compared to routine care [18]. Overall, remote home monitoring can keep an eye on patient disease changes at any time, helping patients with disease assessment and recovery guidance. However, there are also some disadvantages, such as that elderly patients may have difficulty in operating the equipment or have low network coverage in remote areas, resulting in delayed data transmission. Therefore, future research should develop low-power, high-precision contactless monitoring devices, and combine them with artificial intelligence to generate personalized intervention solutions to assist patients in generating educational content, etc. It is also necessary to focus on promoting the inclusion of HRM in medical insurance compensation and establishing unified remote monitoring quality standards. We also pay attention to the impact of remote monitoring at home on prognosis, clarify its optimal treatment plan and follow-up time, and further investigate whether there are differences in outcomes between subgroups of chronic heart failure patients (e.g., by age, severity) using different types of home-based remote monitoring technologies.

4.3 Hospital-community Hospital Linkage

The Hospital-community hospital linkage is one of the core strategies for continuity of care for CHF patients. The cooperation between large hospitals and community hospitals will effectively integrate medical resources and give full play to their respective strengths to provide better continuity care services to patients with CHF [19]. Community hospitals have little experience in treating CHF patients and lack the correct understanding of chronic heart failure. Even with comprehensive evidence-based interventions, independent community hospitals cannot prevent readmissions [20]. At present, the level of community medical services cannot meet the needs of patients with chronic heart failure, mainly due to the lack of community medical resources and the interruption of continuous care. In addition, hospitals and community medical institutions should strengthen collaboration to ensure the continuity of care after discharge. the hospital-to-community seamless care model can effectively improve the quality of life of CHF patients and reduce the recurrence and mortality rate of complications [21]. Therefore, establishing a hospital-community collaborative care model has become an important research direction for improving the prognosis of CHF patients. Caregivers should share patients' diagnostic and treatment information in real time by utilizing an EHR. A professional team of cardiologists, specialist nurses, general practitioners and rehabilitation specialists from major hospitals is also needed to provide patients with individualized nursing solutions. Formulate CHF patients' triage protocols and treatment standards, transfer patients with stable conditions to primary hospitals for long-term treatment. For patients with acute exacerbations, they must be transferred to large hospitals for treatment. To avoid delaying treatment.

5. CHF Continuing Care Content

5.1 Condition Monitoring

Condition monitoring is the core content of continuous care. Before the patient is discharged, nursing staff use heart failure questionnaires and establish an individualized discharge plan (drug list, follow-up time, emergency contact) to evaluate quality of life monitoring. The monitoring of its continuous care includes changes in the patient's physiological indicators and symptoms and medication compliance. uses wearable cardiac monitors to monitor heart rate and heart rhythm, wireless Bluetooth sphygmomanometer, finger - clip - synchronous blood oxygen meter and other monitoring tools, and uses mobile phone APP to record dyspnea, edema, and fatigue every day [22]. Smart medicine boxes are used to record the time and dosage of the drug. reduces CHF worsening and admission rates, but also improves patient compliance with medication. Therefore, it is crucial to install monitoring instruments and perform training operations on patients and families.

5.2 Medication Care

Medication care is an important part of continuous care for patients with CHF. Its core purpose is to improve patients' medication compliance and thus improve patients' prognosis [23]. Improving medication adherence may reduce hospitalization, morbidity and mortality, and reduce medical costs [24]. Studies have shown that long-term oral administration is key to CHF treatment, but low medication compliance in patients leads to an increase in cardiac-related events. In recent years, researchers have significantly improved patients' medication compliance by adopting simplified medication regimens, providing personalized drug education, and using smart reminder systems (such as mobile applications or smart pill boxes). However, individual differences in patients should be considered, especially elderly patients and patients with multiple illnesses. In addition, interdisciplinary teamwork, including doctors, pharmacists, nurses and other healthcare providers, plays an increasingly important role in optimizing drug treatment options. However, most current research focuses on short-term effects, lacking assessments of their long-term adherence and cost-effectiveness. Future research also requires a deeper exploration of remote technology drug management platforms to better adapt to the needs of different patient groups.

5.3 Life Intervention

5.3.1 Dietary guidance

Dietary control is the basis of non-pharmacological treatment in patients with CHF. It is crucial to manage the condition and improve the prognosis. Studies have shown that restricting the intake of sodium salt in the diet can effectively reduce the burden on the heart and reduce the incidence of symptoms [25]. further confirmed that fluid and sodium restriction has a positive effect on maintaining the weight of CHF patients, improving self-management ability and quality of life [26]. However, current dietary management compliance in patients with CHF may be related to the lack of personalized guidance and insufficient community resources. For example, some patients cannot strictly control their salt intake or find it difficult to change their dietary habits and lack of nutritional knowledge. In the future, we can further explore the use of mobile health applications and remote monitoring technologies to assist diet management, and strengthen the integration of community resources to provide patients with more nutritional support. For example, developing a dietary management software to individualize the dietary recommendations of patients' condition, dietary habits and nutritional needs, and use remote monitoring technology to track the patient's dietary status in real time to effectively intervene.

5.3.2 Sports training guidance

Exercise training has significant benefits for health outcomes in patients with CHF. Studies have shown that regular exercise training can improve patients' cardiopulmonary function, exercise endurance, relieve anxiety, depression, and symptoms such as dyspnea. However, current research mostly focuses on short-term effects, and lacks a systematic assessment of the effects of long-term exercise interventions [27,28]. In addition, specific implementations of exercise training (such as frequency, intensity, and duration) vary in different studies and lack uniform standards. This makes it difficult to promote in clinical practice. Therefore, future research needs to further study standardized exercise programs and provide personalized guidance to patients in combination with remote technology. For example, using virtual reality (VR) technology, an immersive physical exercise system can be established for patients to participate in, and combined with wearable devices, the exercise process can be monitored in real time to ensure the safety and efficiency of exercise.

5.3.3 Psychological Nursing

psychosocial nursing interventions is based on nursing behavior and improves negative emotions in patients with CHF [29]. There is a close relationship between the patient's psychological state and the control of the disease. Studies have shown that using adverse psychological conditions in patients with CHF, such as persistent anxiety and depression as stress stimulation sources, can lead to a series of physiological and pathological changes, and may even increase the patient's heart load and affect the treatment effect [30]. In recent years, researchers have significantly improved the patients' psychological state and quality of life through emotional counseling, health education and psychological support [31]. However, current psychological care mostly relies on traditional methods and lacks innovative interventions based on artificial intelligence. In the future, nursing staff should pay attention to training in psychological care and actively explore intelligent psychological intervention plans. For example, establishing a mental health evaluation system based on artificial intelligence, use natural language processing technology to analyze the emotional status of patients, propose individualized psychological intervention plans, and achieve accurate and efficient psychological care for patients.

5.3.4 Strengthen self-management ability

Self-management refers to the management of the signs and symptoms of the disease, treatment, prognosis and lifestyle. It is the core goal of continuity of care for CHF patients,

covering medication, diet, exercise and psychological state management. Good self-management can significantly reduce patients' readmission and mortality [32]. For CHF patients, self-management after discharge is not only a key link in the recovery process, but also plays a crucial role in improving their quality of life and overall health. However, the general lack of self-management ability in patients with CHF may be related to the lack of personalized guidance and social support. Therefore, future research must pay attention to helping patients establish a complete self-management behavior system after discharge to effectively improve the overall prognosis of patients [33]. For example, an intelligent self-management software integrating medication reminders, dietary records, exercise planning, and psychological support is developed. It uses remote monitoring and data analysis to tailor interventions to individual patients and integrate them with community resources to continuously provide help and guidance to patients.

6. Discussion

In general, the clinical needs of patients with chronic heart failure are multifaceted, including condition management and monitoring, exercise training, psychological support and drug management and lifestyle intervention. Meeting these needs can help patients better manage diseases, improve quality of life, prolong survival, and significantly reduce the economic and social pressures that family members and society as a whole. Continuing care brings tripartite resources to hospital, community and family. The integrated continuous and seamless care services are an important means to improve the quality of life of CHF patients, reduce the rate of rehospitalization, and improve the quality of life of patients. Therefore, it is crucial to address these needs through comprehensive care. Currently, studies have confirmed that continuous follow-up, family remote monitoring, and hospital-community contact have good efficacy in the treatment of CHF. However, in actual applications, these forms still have problems such as unbalanced resource allocation, low long-term effect evaluation, and lack of personalized nursing plans.

Future research should focus on the following four aspects: in the following four points: (1) interdisciplinary cooperation: establish a multidisciplinary collaborative continuous care team composed of cardiologists, medical staff, nutritionists, and psychological counselors, and provide patients with comprehensive care services through remote consultation, joint diagnosis and treatment. (2) Personalized care plan: Establish a personalized care plan based on the patient's condition, lifestyle and psychological conditions, and use telemedicine to make dynamic adjustments to adapt to the needs of different patient groups. (3) Policy support and social resource integration: Promote the construction of the health service system, increase investment in community health services, and improve the level of social support through home caregiver training and volunteer services. (4) Technological innovation and application: Explore the introduction of emerging technologies such as artificial intelligence and wearable devices into continuous care to improve care efficiency and quality. In order to achieve research progress in these four aspects, continuous care can improve the prognosis of CHF patients, while also reducing the economic burden of their families and society, providing strong support for the comprehensive health management of CHF patients, and improving the overall quality of care for patients.

References

[1] ROGER VL. Epidemiology of Heart Failure: A Contemporary Perspective. Circ Res. 2021; 128(10): 1421-1434.

[2] MA LY, WANG ZW, FAN J, et al. Key interpretation of the "China Cardiovascular Health and Diseases Report 2021" [J]. Chinese General Practice. 2022; 25(27): 3331-3346.

[3] PANDOLFI MM, WANG Y, SPENARD A, et al. Associations between nursing home performance and hospital 30-day readmissions for acute myocardial infarction, heart failure and pneumonia at the healthcare community level in the United States. Int J Older People Nurs. 2017;12(4).

[4] TRUBY LK, ROGERS JG. Advanced Heart Failure: Epidemiology, Diagnosis, and Therapeutic Approaches. JACC Heart Fail. 2020;8(7):523-536.

[5] PAGANO M, CORALLO F, ANSELMO A, et al. Optimisation of Remote Monitoring Programmes in Heart Failure: Evaluation of Patient Drop-Out Behaviour and Healthcare Professionals' Perspectives. Healthcare (Basel). 2024;12(13):1271.

[6] ZONG ZX, GUAN YM, WANG LN. Research progress on continuity of care for elderly patients with chronic diseases [J]. Chinese Journal of Geriatric Care. 2023; 21(3): 123-126.

[7] YANG XL, LIANG LL, CHENG L. Research status on the construction of continuity of care information platforms [J]. Chinese General Nursing. 2023; 21(29): 4094-4097.

[8] HOOVER C, PLAMANN J, BECKEL J. Outcomes of an Interdisciplinary Transitional Care Quality Improvement Project on Self-Management and Health Care Use in Patients With Heart Failure. J Gerontol Nurs. 2017; 43(1): 23-31.

[9] MAI BA H, SON YJ, LEE K, et al. Transitional Care Interventions for Patients with Heart Failure: An Integrative Review. Int J Environ Res Public Health. 2020;17(8):2925.

[10] XU Y, WANG Y, LI S, et al. Development and evaluation of a continuity of care program for patients with chronic heart failure. Heart Lung. 2022; 51(1): 24-31.

[11] YANG ZH, LI MJ, CHEN YY. Effect analysis of hospital-community-family tripartite linkage nursing model combined with continuity of care on patients with coronary heart disease treated with isosorbide mononitrate [J]. Clinical Research. 2021;29(9):165-167.

[12] YE XM, YOU JJ, LI LF. Impact of continuity of care on self-care ability and quality of life in patients with chronic heart failure [J]. China Health Standard Management. 2022;13(17):180-183.

[13] WANG L, ZHAO M, SUN H, et al. The effect of WeChat platform combined with telephone follow-up on self-management of patients with chronic heart failure after discharge [J]. Chinese Journal of Modern Nursing. 2020;26(3):337-341.

[14] LI N, ZHANG H, LIU Y, et al. Construction and effect evaluation of a continuity of care model for patients with chronic heart failure [J]. Chinese Journal of Nursing. 2019;54(3):309-313.
[15] DAI KK, YAN HY, WU J, et al. The impact of telephone follow-up continuity of care on psychological status, self-efficacy, and quality of life in patients with chronic heart failure [J]. International Journal of Nursing. 2020;39(13):2478-2481.
[16] WANG LH, WU Q, DENG JM, et al. Construction and application of an internet-based heart failure nursing clinic [J]. Knowledge of Cardiovascular Disease Prevention and Treatment. 2022;12(28):63-66.
[17] NEGARANDEH R, ZOLFAGHARI M, BASHI N, et al. Evaluating the Effect of Monitoring through Telephone (Tele-Monitoring) on Self-Care Behaviors and Readmission of Patients with Heart Failure after Discharge. Appl Clin Inform. 2019;10(2):261-268.
[18] PAGANO M, CORALLO F, ANSELMO A, et al. Optimisation of Remote Monitoring Programmes in Heart Failure: Evaluation of Patient Drop-Out Behaviour and Healthcare Professionals' Perspectives. Healthcare (Basel). 2024;12(13):1271.
[19] LIU Y, ZHAO N. Application effect of hospital - community linkage nursing in elderly patients with heart failure and its impact on social support [J]. Guizhou Medical Journal. 2023;47(11):1827-1829.
[20] LINDEN A, BUTTERWORTH S. A comprehensive hospital-based intervention to reduce readmissions for chronically ill patients: a randomized controlled trial. Am J Manag Care. 2014;20(10):783-792.
[21] CAI N, GAO H. The impact of a trinity continuity nursing intervention on the quality of life of outpatients with chronic heart failure [J]. Heilongjiang Medicine and Pharmacy. 2021;44(3):16-17.
[22] WEENK M, BREDIE SJ, KOENEMAN M, et al. Continuous Monitoring of Vital Signs in the General Ward Using Wearable Devices: Randomized Controlled Trial. J Med Internet Res. 2020;22(6):e15471.
[23] GUO JH, LIU JF. Intervention effect of transtheoretical model and planned behavior theory nursing on medication adherence in patients with chronic heart failure [J]. Chinese Journal of Drug Abuse Prevention and Treatment. 2024;30(1):171-174.
[24] SOKOL MC, MCGUIGAN KA, VERBRUGGE RR, et al. Impact of medication adherence on hospitalization risk and healthcare cost. Med Care. 2005;43(6):521-530.
[25] SUN J, XIA LL. Analysis of dietary control self-efficacy and its influencing factors in elderly patients with chronic heart failure [J]. Modern Nurse. 2020; 27(4): 150-153.
[26] CHAO LF. Current status and influencing factors of sodium-restricted diet in patients with chronic heart failure [J]. Modern Diagnosis and Treatment. 2019; 30(6): 923-924.
[27] WANG JQ, WANG XW, JIANG CL, et al. Effect of individualized cardiac exercise rehabilitation training on quality of life scale scores in elderly patients with heart failure [J]. Shanxi Medical Journal. 2021; 50(12): 1994-1997.
[28] WANG ME, WANG B, GAO J, et al. Effects of exercise rehabilitation training on exercise tolerance, cardiac function, and quality of life in patients with chronic heart failure [J]. Journal of Rare and Uncommon Diseases. 2023;30(9):108-109.
[29] HAO R, GUO WL. Application effect of cardiac rehabilitation exercise combined with psychological nursing intervention in elderly patients with chronic heart failure [J]. Clinical Medicine Research and Practice. 2024;9(22):170-173.
[30] ZHU L. Effect of psychological nursing intervention on emotions and cardiac function in elderly patients with chronic heart failure [J]. China Medical Guide. 2021;19(14):202-203.
[31] JIANG ZQ. Effect of early psychological nursing on negative emotions and sleep in elderly patients with chronic heart failure [J]. World Journal of Sleep Medicine. 2022;9(3):429-431.
[32] LIU Y, ZHANG Q, WANG S, et al. Hospital-to-home transition care for patients with chronic heart failure: A randomized controlled trial. Eur J Cardiovasc Nurs. 2022;21(2):98-106.
[33] FENG C, WANG Y, LI S, et al. Effect of self-management intervention on prognosis of patients with chronic heart failure: A meta-analysis. Nurs Open. 2023;10(4):2015-2029.

Author Profile

Ying He corresponding author, Female, postgraduate student, research direction: nursing care for chronic diseases, Xizang Minzu University for Nationalities, email: yinghe@xzmu.edu.cn

Zhenla first author, Female, postgraduate student, research direction: nursing care for chronic diseases, Xizang Minzu University for Nationalities, email: 197736372@qq.com