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*Article*

# Investigating the Impact of Continuing Care Model on Quality of Life and Cardiac Function in Patients With Coronary Heart Disease

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**Abstract**

**Aims/Background**: The transition from hospital to home is a critical period for patients with coronary heart disease (CHD), and inadequate post-discharge care can adversely affect recovery. Continuing care models have been proposed to address these challenges, but their relative effectiveness compared with standard care still requires further evaluation. Therefore, this study evaluated the impact of continuing care on quality of life and recovery of cardiac function in patients with CHD. **Methods**: This single-center, retrospective cohort study included 135 discharged CHD patients. Based on nursing plans, patients were allocated into two groups: a Continuing Care Group (n = 61) and a Routine Care Group (n = 74). The Continuing Care Group received a structured, nurse-led 3-month program, while the Routine Care Group received standard post-discharge instructions. Various parameters, including cardiac function, quality of life, psychological well-being, self-care capacity, medication adherence, overall comfort, and nursing satisfaction, were compared between groups at 3-month follow-up. **Results**: At 3 months, the Continuing Care Group showed significantly greater improvement in left ventricular ejection fraction (LVEF, 58.31% vs. 54.88%), six-minute walk distance (6MWD, 399.34 m vs. 382.25 m), 36-Item Short-Form Health Survey Physical Component Summary (SF-36 PCS, 67.94 vs. 63.92), and 36-Item Short-Form Health Survey Mental Component Summary (SF-36 MCS, 71.46 vs. 66.87). Patients in the Continuing Care Group also reported lower Depression Anxiety Stress Scales-21 (DASS-21, 17.24 vs. 18.31) and Perceived Stress Scale-10 (PSS-10) scores (22.01 vs. 23.14), higher Psychological General Well-Being Index (PGWBI, 85.95 vs. 83.47), Exercise of Self-Care Agency Scale (ESCA, 116.03 vs. 113.72), and Post-Traumatic Growth Inventory (PTGI) scores (74.81 vs. 72.31), along with superior medication adherence (84.16 vs. 82.35), comfort (87.06 vs. 84.91) and nursing satisfaction (86.94 vs. 84.89). At 3-month follow-up, Seattle Angina Questionnaire (SAQ) scores improved significantly from baseline in both groups, but no significant between-group difference was observed. **Conclusion**: Continuing care is associated with potential improvements in cardiac function, quality of life, psychological well-being, self-management, medication adherence, and patient-reported experiences compared with routine care in patients with CHD.

**Keywords:** continuity of patient care; coronary disease; quality of life; heart function tests; patient discharge

## 1. Introduction

Coronary heart disease (CHD) remains a major public health concern worldwide, with a substantially high rate of morbidity and mortality. Even with modern treatment approaches, many patients do not achieve optimal therapeutic outcomes due to inadequate post-discharge care and lack of adherence to recommended therapies [1,2]. Long-term CHD management requires not only acute hospital-based care but also comprehensive, ongoing support to maintain recovery and improve quality of life. This underscores the importance of developing and evaluating structured continuing care programs that can address both physical and psychological aspects of patient well-being [3,4].

After discharge, CHD care often targets modifiable risk factors, including hypertension, hyperlipidemia, and diabetes, while promoting lifestyle changes such as a healthier diet and regular physical activity. However, traditional care models often do not provide the continuous support required for long-term success. Many patients face challenges with medication adherence, emotional distress, and difficulties in adjusting to new routines. These challenges highlight the need for integrated care approaches that extend beyond the hospital setting and provide tailored, ongoing guidance and support [5–7]. Continuing care programs aim to address these gaps through structured follow-up, personalized education, and psychological support, thereby addressing multiple facets of patient health.

Continuing care for CHD patients involves structured follow-up visits, personalized education, psychological support, and lifestyle modification programs. In this study, "continuing care" refers to a structured, nurse-led intervention program guided by the Omaha System problem-solving framework, which focuses on holistic assessment, planning, intervention, and evaluation. The intervention included individualized care planning, scheduled follow-up contacts, systematic education about disease and self-management, proactive psychosocial support, and coordination among healthcare providers. These components aim

to enhance adherence to prescribed treatments, improve functional capacity, and alleviate psychological challenges. Generally, this intervention model is intended to smooth the transition from hospital to home by ensuring that patients have access to necessary guidance, monitoring, and resources to manage their condition effectively. The rationale behind this approach reflects the reality that CHD management extends far beyond the initial intervention and requires continuous attention to both physical and psychological health [8–10].

Cardiac function recovery is a central goal in CHD patients, impacting their ability to resume normal activities and maintain quality of life [11,12]. Left ventricular ejection fraction (LVEF) is a widely used indicator to assess cardiac performance, and improvements are generally linked to better clinical outcomes and reduced hospital readmissions. Functional capacity, usually measured by the six-minute walk distance (6MWD), reflects real-world physical endurance and the ability to perform daily activities. Effective post-discharge care may enhance these parameters by improving patient outcomes and reducing CHD burden. Quality of life is equally crucial and includes physical, mental, and social dimensions. Many CHD patients often experience anxiety, depression, and persistent stress, which can hinder recovery and reduce adherence to care. Comprehensive care models incorporating psychological support and assessing outcomes with tools such as the 36-Item Short-Form Health Survey (SF-36) can help identify and alleviate these burdens. By addressing both clinical indicators and psychological well-being, these care models aim to enhance overall quality of life for CHD patients, supporting their long-term recovery [13].

The multifaceted nature of CHD necessitates a comprehensive care approach that extends beyond initial treatment. Continuing care programs offer a promising solution to provide structured follow-up, personalized education, and psychological support, aimed at improving cardiac function recovery, reinforcing medication adherence, and enhancing quality of life. By addressing both physical and psychological aspects of patient health, these programs have the potential to significantly enhance outcomes for CHD patients. Therefore, this study assessed the impact of continuing care interventions to help optimize post-discharge management and improve prognostic outcomes for patients living with CHD.

## 2. Methods

### *2.1 Study Design and Recruitment of the Study Participants*

This single-center, retrospective cohort study assessed the impact of a continuing care model on patients with CHD. This study was performed in accordance with the principles outlined in the Declaration of Helsinki.

The study cohort included 135 patients diagnosed with CHD who were discharged from Central Hospital Affiliated to Shandong First Medical University between September 2023 and September 2024.

Patients were enrolled if they met all of the following criteria: (1) age 18 years or older; (2) CHD diagnosis confirmed according to the 2019 European Society of Cardiology (ESC) guidelines [14]; (3) New York Heart Association (NYHA) functional classification of grade II or III; and (4) completion of the index hospitalization.

Exclusion criteria included: (1) severe comorbid conditions likely to limit life expectancy or hinder study participation (e.g., NYHA Class IV cardiac failure, severe renal or hepatic failure, metastatic malignancy); (2) major cognitive or psychiatric disorders impairing the ability to complete questionnaires; (3) participation in other formal cardiac rehabilitation trials during the follow-up period; or (4) incomplete medical records or loss to follow-up before the 3-month assessment.

Based on the nursing plan, patients were allocated into two cohorts: a Routine Care Group (n = 74) and a Continuing Care Group (n = 61). Allocation was non-random and reflected clinical decision-making and resource availability at the time of discharge. While Table 1 shows no statistically significant baseline differences across the measured covariates, we acknowledge that residual confounding due to unmeasured factors cannot be excluded. Propensity score matching was considered but not employed because of the moderate sample size and the risk of substantial reductions in analytical power; instead, we conducted comprehensive baseline comparisons and interpreted the results as associations rather than causal effects.

### *2.2 Intervention Protocol*

Patients in the Routine Care Group received standard post-discharge care, which comprised verbal guidance on medications, diet, and physical activity, along with a scheduled outpatient clinic follow-up visit approximately 3 months after discharge. In contrast, patients in the Continuing Care Group participated in an established, structured continuing care pathway in addition to routine care. This pathway, developed with reference to the Omaha System problem-solving framework [15], was documented to focus on comprehensive assessment and individualized intervention.

A review of clinical and nursing records indicated that the program included five main elements: (1) a comprehensive assessment before discharge with a personalized care plan; (2) scheduled follow-up contacts, including weekly telephone calls during the first month and then bi-weekly call until the end of the third month, with at least one video consultation; (3) systematic education focused on medication adherence, risk factor management, and early symptom recognition, delivered through educational booklets and reinforced during follow-up interactions (covering medication purpose, dietary sodium restriction, and warning signs of worsening condition); (4) basic psychosocial support and

**Table 1. Comparison of baseline sociodemographic and clinical characteristics between the two groups.**

| Parameter | Routine Care Group (n = 74) | Continuing Care Group (n = 61) | $t/\chi^2$ | $p$-value |
|---|---|---|---|---|
| Age (years) | 58.47 ± 8.24 | 58.81 ± 7.93 | 0.243 | 0.808 |
| BMI (kg/m$^2$) | 24.04 ± 2.12 | 24.13 ± 2.31 | 0.237 | 0.813 |
| Gender [n (%)] | | | 0.254 | 0.614 |
| Male | 48 (64.86%) | 37 (60.66%) | | |
| Female | 26 (35.14%) | 24 (39.34%) | | |
| Course of the disease (years) | 4.34 ± 0.56 | 4.39 ± 0.62 | 0.519 | 0.604 |
| Combined hypertension [n (%)] | 34 (45.95%) | 30 (49.18%) | 0.140 | 0.708 |
| Combined diabetes [n (%)] | 13 (17.57%) | 13 (21.31%) | 0.301 | 0.583 |
| Current smoker [n (%)] | 22 (29.73%) | 18 (29.51%) | 0.001 | 0.978 |
| Alcohol use [n (%)] | 15 (20.27%) | 11 (18.03%) | 0.108 | 0.743 |
| NYHA classification [n (%)] | | | 0.219 | 0.640 |
| Class II | 31 (41.89%) | 28 (45.9%) | | |
| Class III | 43 (58.11%) | 33 (54.10%) | | |
| Number of affected blood vessels [n (%)] | | | 0.319 | 0.572 |
| One vessel | 46 (62.16%) | 35 (57.38%) | | |
| Two vessels | 28 (37.84%) | 26 (42.62%) | | |
| Degree of coronary artery stenosis (%) | 72.32 ± 2.09 | 72.55 ± 2.18 | 0.621 | 0.536 |
| Location of the diseased blood vessel [n (%)] | | | 0.339 | 0.844 |
| Right coronary artery | 27 (36.49%) | 20 (32.79%) | | |
| Left circumflex artery | 11 (14.86%) | 11 (18.03%) | | |
| Left anterior descending branch | 36 (48.65%) | 30 (49.18%) | | |

BMI, body mass index; NYHA, New York Heart Association.

patient empowerment strategies, including active listening, encouragement, and simple nurse-guided stress coping techniques; and (5) documented care coordination among the patient, cardiologist, and primary care physician, with nurses communicating any significant concerns or clinical changes via the hospital's electronic health record system.

Both patient groups were also scheduled for a routine outpatient clinic follow-up visit approximately 3 months after discharge, consistent with standard clinical practice.

### *2.3 Blood Sample Collection and Biochemical Assays*

Following an overnight fast of at least 8 hours, venous blood samples were collected from all participants, and serum was obtained by centrifugation. Serum levels of total cholesterol (TC), triglycerides (TG), and high-density lipoprotein cholesterol (HDL-C) were measured using enzymatic colorimetric assays on a Mindray BS-2000M automated biochemical analyzer (Mindray Bio-Medical Electronics Co., Ltd., Shenzhen, China). Low-density lipoprotein cholesterol (LDL-C) was also calculated. Glycated hemoglobin (HbA1c) was quantified by high-performance liquid chromatography (HPLC) using the Bio-Rad D-100 system (Bio-Rad Laboratories, Inc., Hercules, California, USA). Additionally, serum N-terminal pro-B-type natriuretic peptide (NT-proBNP) levels were determined using an electrochemiluminescence immunoassay on a Cobas e 801 analyzer (Roche Diagnostics, Rotkreuz, Switzerland).

### *2.4 Outcome Measures and Data Collection*

Baseline demographic and clinical characteristics were retrieved from medical records at the time of the index discharge. Outcomes were assessed at two time points: baseline (at discharge) and the 3-month follow-up. Data were collected through medical record review, structured telephone interviews, and documentation from outpatient clinic records. Cardiac function recovery was evaluated using objective indicators. Functional exercise capacity was measured using the six-minute walk test (6MWT), reported as the total distance walked in meters.

Laboratory parameters at three months (such as NT-proBNP and lipid indices) were determined from blood samples collected during the scheduled outpatient follow-up visit. Functional tests like the 6MWT were performed during the same clinic visit. Questionnaires for quality of life, psychological well-being, medication adherence, comfort, and satisfaction were collected either via structured telephone interviews conducted by research nurses who were blinded to group allocation or through questionnaires completed by patients during the clinic visit.

#### 2.4.1 Quality of Life and Disease-Specific Health Status

Health-related quality of life was assessed using the SF-36 as a generic tool. The 36 items generate two composite components: the Physical Component Summary (PCS) and the Mental Component Summary (MCS). Each index score ranges from 0 to 100, with higher scores indicating

**Table 2. Comparison of baseline laboratory parameters between the two groups.**

| Parameter | Routine Care Group (n = 74) | Continuing Care Group (n = 61) | *t* | *p*-value |
|---|---|---|---|---|
| Total cholesterol (mg/dL) | 132.48 ± 22.76 | 128.92 ± 21.15 | 0.935 | 0.352 |
| HDL cholesterol (mg/dL) | 40.31 ± 8.07 | 41.18 ± 8.63 | 0.604 | 0.547 |
| LDL cholesterol (mg/dL) | 82.65 ± 28.34 | 79.47 ± 26.92 | 0.663 | 0.508 |
| Triglycerides (mg/dL) | 123.26 ± 35.73 | 122.79 ± 34.42 | 0.077 | 0.938 |
| HbA1c (%) | 6.81 ± 1.19 | 6.97 ± 1.28 | 0.744 | 0.458 |

HDL, high-density lipoprotein; LDL, low-density lipoprotein; HbA1c, glycated hemoglobin.

**Table 3. Comparison of cardiac function recovery indicators between groups.**

| Parameter | Routine Care Group (n = 74) | Continuing Care Group (n = 61) | *t* | *p*-value |
|---|---|---|---|---|
| LVEF (%) | | | | |
| Baseline | 52.34 ± 6.83 | 53.07 ± 7.18 | 0.604 | 0.547 |
| 3 months | 54.88 ± 7.12* | 58.31 ± 6.47* | 2.895 | 0.004 |
| NT-proBNP (pg/mL) | | | | |
| Baseline | 452.17 ± 111.45 | 426.83 ± 109.64 | 1.325 | 0.188 |
| 3 months | 286.35 ± 76.42* | 277.24 ± 77.83* | 0.684 | 0.495 |
| 6MWD (meters) | | | | |
| Baseline | 348.63 ± 45.33 | 353.82 ± 43.17 | 0.676 | 0.500 |
| 3 months | 382.25 ± 50.44* | 399.34 ± 47.92* | 2.004 | 0.047 |

LVEF, left ventricular ejection fraction; NT-proBNP, N-terminal pro-B-type natriuretic peptide; 6MWD, six-minute walk distance. *: $p < 0.05$ for within-group comparison between baseline and 3 months.

better health status. The tool showed acceptable reliability, with Cronbach's $\alpha$ coefficient exceeding 0.70 [16].

Disease-specific health status was assessed using the Seattle Angina Questionnaire (SAQ). The SAQ comprises 19 items across five domains: Physical Limitation, Angina Stability, Angina Frequency, Treatment Satisfaction, and Disease Perception. Domain scores are standardized to a 0–100 scale, and an overall score (0–500) is calculated, where higher scores denote better functional status and fewer angina-related limitations. The SAQ demonstrated good internal consistency (Cronbach's $\alpha = 0.759$) [10].

#### 2.4.2 Psychological Stress, Perceived Stress, and Psychological Well-Being

Psychological status was evaluated using validated tools to capture various dimensions of emotional well-being. Negative emotional symptoms were assessed with the Depression Anxiety Stress Scales-21 (DASS-21), which includes three 7-item subscales for Depression, Anxiety, and Stress. Each item is rated on a 4-point scale from 0 to 3. For this study, a total score ranging from 0 to 63 was used, with higher scores indicating greater psychological distress (Cronbach's $\alpha = 0.897$) [10].

Perceived Stress Scale-10 (PSS-10), a 10-item instrument, assessed the degree to which life situations were appraised as stressful over the previous month. Items are rated on a 5-point frequency scale (0–4), yielding a total score from 0 to 40, where higher scores reflect greater perceived stress (Cronbach's $\alpha = 0.823$) [10]. Subjective psychological well-being and distress were evaluated using the Psychological General Well-Being Index (PGWBI). This 22-item instrument yields a total score ranging from 0 to 110, with higher scores indicating better psychological well-being. A Previous study indicates that PGWBI has good construct validity and high internal consistency [17].

#### 2.4.3 Self-Management Capacity and Post-Traumatic Growth

Self-care capacity was determined using the Exercise of Self-Care Agency Scale (ESCA), which examines patients' ability to perform self-care behaviors. This ESCA comprises 43 items rated on a 5-point Likert scale (0–4) and covers four dimensions: Self-Concept, Health Knowledge, Self-Care Responsibility, and Self-Care Skills. Total score ranges between 0 and 172, with higher scores indicating greater self-care ability (Cronbach's $\alpha = 0.884$) [10].

Positive psychological adaptation following the cardiac event was measured using the Post-Traumatic Growth Inventory (PTGI). This 21-item tool uses a 6-point scale (0–5) and yields a total score between 0 and 105. Higher scores represent greater perceived positive change (Cronbach's $\alpha = 0.831$) [10].

#### 2.4.4 Medication Adherence, Comfort, and Satisfaction

Medication adherence was assessed using a 20-item self-report questionnaire adapted from previously established methodologies (as described in [10,18]) and it does not have an established scale name. The items cover key aspects of health behaviors, including medication compliance, follow-up attendance, and lifestyle management.

**Table 4. Comparison of quality of life between the two groups.**

| Parameter | Routine Care Group (n = 74) | Continuing Care Group (n = 61) | $t$ | $p$-value |
|---|---|---|---|---|
| SF-36 PCS | | | | |
| Baseline | 59.63 ± 8.38 | 61.57 ± 9.28 | 1.277 | 0.204 |
| 3 months | 63.92 ± 9.07* | 67.94 ± 8.65* | 2.620 | 0.010 |
| SF-36 MCS | | | | |
| Baseline | 65.28 ± 9.71 | 64.69 ± 10.04 | 0.347 | 0.729 |
| 3 months | 66.87 ± 9.52 | 71.46 ± 8.94* | 2.862 | 0.005 |

SF-36, 36-Item Short-Form Health Survey; PCS, Physical Component Summary; MCS, Mental Component Summary. *: $p < 0.05$ for within-group comparison between baseline and 3 months.

**Table 5. Comparison of cardiac health status between the two groups.**

| Parameter | Routine Care Group (n = 74) | Continuing Care Group (n = 61) | $t$ | $p$-value |
|---|---|---|---|---|
| SAQ | | | | |
| Baseline | 251.37 ± 13.05 | 252.14 ± 13.31 | 0.340 | 0.734 |
| 3 months | 285.75 ± 14.61* | 286.63 ± 14.82* | 0.345 | 0.730 |

SAQ, Seattle Angina Questionnaire. *: $p < 0.05$ for within-group comparison between baseline and 3 months.

Each item is scored on a 5-point Likert scale, yielding a total score between 20 and 100, with higher scores indicating better adherence (Cronbach's $\alpha = 0.802$) [10].

Patient comfort was evaluated using the General Comfort Questionnaire (GCQ). This scale comprises 30 items across four dimensions, each rated on a 4-point Likert scale. Total scores range from 30 to 120, with higher scores reflecting greater comfort (Cronbach's $\alpha = 0.906$) [10]. Furthermore, nursing satisfaction was measured using a hospital-developed 20-item questionnaire encompassing five domains, including service attitude and professional competence. Each item is scored on a 5-point Likert scale, yielding a total score between 20 and 100, where higher scores denote greater satisfaction (Cronbach's $\alpha = 0.814$) [10].

### *2.5 Statistical Analysis*

Statistical analyses were conducted using SPSS Statistics (version 29.0; IBM Corp., Armonk, NY, USA). Analyses were performed on the full dataset after verifying that no variable contained missing data. Because the dataset was complete, no imputation procedure was performed. Normality of continuous variables was assessed using the Shapiro–Wilk test. Normally distributed variables were expressed as mean ± standard deviation, and inter-group comparisons were performed using an independent samples $t$-test. For within-group comparisons (baseline vs. 3 months within the same group), a paired samples $t$-test was used. Categorical variables were summarized as frequency counts and percentages [n (%)], with differences between groups determined using the Chi-square test. All statistical tests were two-tailed, and a $p$-value of less than 0.05 was considered statistically significant.

## 3. Results

### *3.1 Comparison of Baseline Characteristics Between Groups*

Comparison of baseline sociodemographic and clinical characteristics between the Routine Care and Continuing Care groups (Table 1) showed no statistically significant differences across the assessed parameters. Indicators, including age, body mass index (BMI), gender distribution, disease duration, combined hypertension and diabetes, smoking status, alcohol use, NYHA classification, number of affected coronary vessels, severity of coronary stenosis, and the location of diseased vessels were comparable between the two groups ($p > 0.05$).

Similarly, baseline laboratory parameters were also comparable between the two groups (Table 2), with no significant differences observed for any of the evaluated indicators, including total cholesterol, high-density lipoprotein (HDL) cholesterol, low-density lipoprotein (LDL) cholesterol, triglycerides, and HbA1c ($p > 0.05$).

### *3.2 Comparison of Cardiac Function Indicators Between Groups*

As detailed in Table 3, cardiac function recovery indicators, including LVEF, NT-proBNP, and 6MWD, were comparable between the Routine Care and Continuing Care groups (all $p > 0.05$). At the 3-month follow-up, patients in the Continuing Care Group had significantly better outcomes than the Routine Care Group, with higher LVEF (58.31 vs. 54.88, $t = 2.895$, $p = 0.004$) and greater 6MWD (399.34 m vs. 382.25 m, $t = 2.004$, $p = 0.047$). However, no significant difference was observed in NT-proBNP levels at 3 months (Routine Care: 286.35 vs. Continuing Care: 277.24, $t = 0.684$, $p = 0.495$). Within each group, all cardiac

**Table 6. Comparison of psychological stress and well-being between the two groups.**

| Parameter | Routine Care Group (n = 74) | Continuing Care Group (n = 61) | $t$ | $p$-value |
|---|---|---|---|---|
| DASS-21 | | | | |
| Baseline | 21.58 ± 3.67 | 21.01 ± 3.75 | 0.888 | 0.376 |
| 3 months | 18.31 ± 2.34* | 17.24 ± 2.06* | 2.803 | 0.006 |
| PSS-10 | | | | |
| Baseline | 27.64 ± 2.57 | 27.19 ± 2.64 | 0.995 | 0.322 |
| 3 months | 23.14 ± 2.66* | 22.01 ± 2.43* | 2.555 | 0.012 |
| PGWBI | | | | |
| Baseline | 78.69 ± 7.58 | 79.96 ± 7.84 | 0.950 | 0.344 |
| 3 months | 83.47 ± 7.35* | 85.95 ± 6.87* | 2.011 | 0.046 |

DASS-21, Depression Anxiety Stress Scales-21; PSS-10, Perceived Stress Scale-10; PGWBI, Psychological General Well-Being Index. *: $p < 0.05$ for within-group comparison between baseline and 3 months.

**Table 7. Comparison of self-care and post-traumatic growth capacity between the two groups.**

| Parameter | Routine Care Group (n = 74) | Continuing Care Group (n = 61) | $t$ | $p$-value |
|---|---|---|---|---|
| ESCA | | | | |
| Baseline | 82.29 ± 4.64 | 83.11 ± 4.69 | 1.016 | 0.311 |
| 3 months | 113.72 ± 5.23* | 116.03 ± 5.75* | 2.440 | 0.016 |
| PTGI | | | | |
| Baseline | 60.27 ± 3.56 | 60.79 ± 3.66 | 0.830 | 0.408 |
| 3 months | 72.31 ± 4.08* | 74.81 ± 4.72* | 3.308 | 0.001 |

ESCA, Exercise of Self-Care Agency Scale; PTGI, Post-Traumatic Growth Inventory. *: $p < 0.05$ for within-group comparison between baseline and 3 months.

function parameters improved significantly from baseline to 3 months (all $p < 0.05$).

### *3.3 Comparison of Quality of Life and Health Status Between Groups*

As shown in Table 4, baseline SF-36 PCS and MCS scores did not show significant differences between the Routine Care and Continuing Care groups (SF-36 PCS: $t = 1.277$, $p = 0.204$; SF-36 MCS: $t = 0.347$, $p = 0.729$). At the 3-month follow-up, both SF-36 PCS and MCS scores were significantly higher in the Continuing Care Group compared to the Routine Care Group (PCS: 67.94 vs. 63.92, $t = 2.620$, $p = 0.010$; MCS: 71.46 vs. 66.87, $t = 2.862$, $p = 0.005$). Within-group comparisons revealed that PCS improved significantly from baseline to 3 months in both groups (both $p < 0.05$). For MCS, a significant improvement was observed only in the Continuing Care Group ($p < 0.05$), whereas the change in the Routine Care Group did not reach statistical significance ($p > 0.05$).

Furthermore, comparison of cardiac health status revealed that baseline SAQ scores were comparable between the Routine Care and Continuing Care groups ($t = 0.340$, $p = 0.734$) (Table 5). At the 3-month follow-up, the pattern remained unchanged with no significant differences in SAQ scores ($t = 0.345$, $p = 0.730$). However, SAQ scores improved significantly from baseline to 3 months within each group (all $p < 0.05$).

### *3.4 Comparison of Psychological Status Between Groups*

As summarized in Table 6, baseline levels of psychological stress and well-being were comparable between the Routine Care and Continuing Care groups, with no substantial differences in DASS-21, PSS-10, and PGWBI scores (all $p > 0.05$). At the 3-month follow-up, the Continuing Care Group showed better psychological outcomes, with significantly lower DASS-21 and PSS-10 scores and a higher PGWBI score than the Routine Care Group (DASS-21: 17.24 vs. 18.31, $t = 2.803$, $p = 0.006$; PSS-10: 22.01 vs. 23.14, $t = 2.555$, $p = 0.012$; PGWBI: 85.95 vs. 83.47, $t = 2.011$, $p = 0.046$). In both groups, all parameters improved significantly from baseline to 3 months (all $p < 0.05$).

As presented in Table 7, baseline ESCA and PTGI were comparable between the Routine Care and Continuing Care groups (both $p > 0.05$). At the 3-month follow-up, ESCA and PTGI scores were significantly higher in the Continuing Care Group compared to the Routine Care Group (ESCA: 116.03 vs. 113.72, $t = 2.440$, $p = 0.016$; PTGI: 74.81 vs. 72.31, $t = 3.308$, $p = 0.001$). In both patient groups, these parameters improved significantly from baseline to 3 months (all $p < 0.05$).

### *3.5 Comparison of Medication Adherence, Comfort, and Nursing Satisfaction Between Groups*

The 3-month follow-up assessment revealed significant between-group differences in medication adherence, comfort, and nursing satisfaction (Table 8). Com-

**Table 8. Comparison of medication adherence, comfort, and nursing satisfaction between groups (3-month follow-up).**

| Parameter | Routine Care Group (n = 74) | Continuing Care Group (n = 61) | *t* | *p*-value |
|---|---|---|---|---|
| Medication adherence | 82.35 ± 3.45 | 84.16 ± 3.36 | 3.055 | 0.003 |
| Overall comfort (GCQ Total) | 84.91 ± 4.05 | 87.06 ± 4.58 | 2.899 | 0.004 |
| Nursing satisfaction (0–100) | 84.89 ± 5.81 | 86.94 ± 5.22 | 2.130 | 0.035 |

GCQ, General Comfort Questionnaire.

pared with the Routine Care Group, the Continuing Care Group demonstrated higher medication adherence (84.16 vs. 82.35, $t = 3.055$, $p = 0.003$), greater overall comfort as detected by the GCQ total score (87.06 vs. 84.91, $t = 2.899$, $p = 0.004$), and higher nursing satisfaction (86.94 vs. 84.89, $t = 2.130$, $p = 0.035$).

## 4. Discussion

CHD is a leading cause of morbidity and mortality worldwide, necessitating effective strategies for improving patient outcomes beyond the initial treatment phase. This study aimed to evaluate the impact of continuing care on quality of life and recovery of cardiac function in patients with CHD. Overall, the findings indicate that continuing care may offer substantial benefits over routine care, with improvement observed across cardiac function, quality of life, psychological outcomes, and adherence to medical recommendations.

The improvements observed in LVEF and 6MWD suggest that the continuing care can enhance cardiac function recovery. LVEF is a critical indicator of cardiac function and reflects how effectively the heart pumps blood. The higher LVEF observed in the Continuing Care Group indicates improved myocardial recovery and overall cardiac performance. This improvement could be attributed to more consistent medication adherence and lifestyle modifications, such as dietary improvement and a gradual increase in physical activity, which are often emphasized in continuing care programs. These interventions help reduce cardiovascular strain, optimize risk factor control, and support functional recovery. Similarly, 6MWD measures functional capacity and endurance crucial to daily activities and overall physical well-being. The improvement in 6MWD suggests that continuing care interventions may help patients regain their endurance and physical strength more effectively [19–21]. These findings align with previous research, including Huang *et al.* [8], which reported that comprehensive post-discharge care can improve cardiovascular outcomes by promoting lifestyle changes and strengthening adherence to medication regimens.

Quality of life assessments with the SF-36 PCS and MCS revealed notable differences in the Continuing Care Group, with higher scores in both the PCS and MCS. Improvement in PCS suggests better physical functioning, fewer limitations from symptoms, and more favorable perceptions of general health. Higher MCS scores suggest advantages in areas such as vitality, social functioning, emotional role performance, and mental health. Collectively, these improvements suggest that continuing care can support recovery in a broader, more person-centered way by addressing physical and psychological needs simultaneously through structured follow-up visits, educational sessions, and psychological support [5,22]. Regular follow-up contacts enable healthcare providers to monitor patients closely, adjust treatment plans as needed, improve self-management skills, and provide early response to emerging concerns. This holistic approach is particularly beneficial in CHD, where anxiety, low mood, and stress often coexist with physical symptoms [23,24].

In contrast, SAQ scores were comparable between the two groups, even though both groups improved over time. One likely explanation is that the SAQ is strongly focused on angina-specific symptoms and their functional impact. Because both groups received optimal medical therapy and the follow-up period was limited to 3 months, the additional supportive elements of continuing care may not have yielded significant differences in angina frequency, stability, or symptom perception at this time point. By comparison, broader measures such as the SF-36 and psychologically focused tools may be more sensitive to the changes driven by education, reassurance, and ongoing support.

In terms of psychological outcomes, patients receiving continuing care showed improvements across various indicators, including DASS-21, PSS-10, and PGWBI scores, which indicate emotional distress (depression, anxiety, and stress), perceived stress, and overall psychological well-being, respectively. The observed enhancements suggest that continuing care interventions may reduce psychological distress and promote mental health. The inclusion of psychological support services in continuing care programs helps patients manage stress and anxiety through counseling and education on coping strategies. Psychological support is crucial for CHD patients, as they often experience heightened psychological stress and anxiety related to living with this clinical condition. By providing regular counseling and education on stress management techniques, continuing care programs can help alleviate these burdens [25–27]. Improvements in PTGI and ESCA scores further indicate that continuing care may foster post-traumatic growth and self-care capacity. Post-traumatic growth refers to positive psychological changes experienced as a result of struggling with highly challenging life circumstances, while self-care capacity involves the ability to manage one's own health needs. Enhancing these

capacities can empower patients to take an active role in their recovery process. Regular follow-up interactions, tailored education, and feedback within continuing care likely help patients gain confidence and skills in managing their condition independently over time [28,29].

Medication adherence, overall comfort, and nursing satisfaction were all higher in the Continuing Care Group compared to the Routine Care Group. Adherence to prescribed treatments is essential for optimal CHD management. Continuing care programs often reinforce adherence through structured follow-up, reminders, and personalized education, helping patients understand the purpose of treatment and lifestyle recommendations. Higher levels of adherence may therefore lead to better clinical outcomes and reduced risks of adverse events. Higher overall comfort and nursing satisfaction scores further highlight the importance of patient-centered care. When patients feel they are being listened to, guided, and supported, they are more likely to report better comfort and a more positive care experience. High-quality nurse-patient interactions can contribute to a more positive hospital experience, potentially reducing anxiety, strengthening trust, and promoting faster recovery [30–32].

Despite these promising findings, several limitations should be acknowledged. First, the study's retrospective design limits the ability to establish causal relationships, and selection bias cannot be entirely excluded. The primary analysis compared outcomes for 3 months between groups, with additional reporting of within-group improvements over time. However, a formal group-by-time interaction analysis was not conducted, which precludes definitive causal attribution of the observed differences in improvement to the continuing intervention rather than to other factors. Second, the relatively short follow-up period of three months may not capture long-term effects of continuing care interventions. Third, multiple secondary outcome measures were compared without adjustment for multiple comparisons, increasing the risk of Type I error. Therefore, the findings, particularly for secondary outcomes, should be interpreted as exploratory and require confirmation in future studies. Future prospective studies with longer follow-up periods and larger sample sizes are needed to validate these findings and explore the durability of the benefit. Moreover, future research should focus on identifying specific components of continuing care that are most effective, enabling the development of optimized intervention protocols tailored to individual patient needs.

Overall, this study provides evidence that continuing care may improve recovery for patients with CHD, particularly in enhancing cardiac function, quality of life, psychological well-being, and adherence to medical recommendations. These findings underscore the importance of comprehensive post-discharge care in improving patient outcomes and suggest potential avenues for future research and clinical practice. By implementing structured and patient-centered continuing care programs, healthcare providers can better support CHD patients throughout their recovery journey, ultimately improving health and well-being. Further investigations are warranted to confirm these findings and refine care strategies to maximize their effectiveness.

## 5. Conclusion

These findings suggest that continuing care may offer potential benefits over routine post-discharge management for patients with CHD, particularly in supporting recovery and day-to-day functioning. Patients receiving continuing care exhibited greater improvements in left ventricular ejection fraction and six-minute walk distance, indicating enhanced cardiac performance and functional capacity. Furthermore, continuing care was associated with higher physical and mental quality of life measures, suggesting its role in addressing multiple dimensions of health. Moreover, improvements in psychological well-being and post-traumatic growth further indicate the potential of continuing care to support mental health and self-care capacity. Finally, the higher adherence, comfort, and nursing satisfaction observed in the Continuing Care Group highlight its effectiveness in promoting patient-centered care.

## Key Points

• Compared with routine post-discharge care, the 3-month continuing care intervention was associated with better outcomes in key cardiac function indicators, particularly left ventricular ejection fraction and six-minute walk distance.

• Patients receiving continuing care also reported significantly better physical and mental quality of life, reduced psychological distress, enhanced self-care capacity, and greater post-traumatic growth.

• At 3-month follow-up, the Continuing Care Group demonstrated higher medication adherence, better overall comfort, and higher satisfaction with nursing care.

• Overall, these findings suggest that a structured continuing care pathway may offer a multifaceted benefit for CHD patients, improving both physiological outcomes and psychosocial adjustment during the critical post-discharge period.

## Availability of Data and Materials

The data that support the findings of this study are available from the corresponding author upon reasonable request.

## Author Contributions

YPX drafted the initial draft. YPX, HZ, and JYG designed the research study. YPX, HZ, and JYG performed the research. JYG analyzed the data. All authors contributed to the important editorial changes in the manuscript. All authors read and approved the final

manuscript. All authors have participated sufficiently in the work and agreed to be accountable for all aspects of the work.

## Ethics Approval and Consent to Participate

This study strictly adheres to the principles of the Declaration of Helsinki. The study protocol was reviewed and approved by the Institutional Review Board of Central Hospital Affiliated to Shandong First Medical University (20260107006), and the requirement for informed consent was waived due to the retrospective analysis of anonymized clinical data.


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## Conflicts of Interest

The authors declare no conflicts of interest.

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