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The Impact of Hospital-Community-Home Collaborative Continuum of Care on Cognitive Function and Caregiver Burden in Stroke Patients with Cognitive Impairment

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Abstract

To investigate the effects of integrated hospital-community-home continuity of care on cognitive function and caregiver burden in stroke patients with cognitive impairment, a total of 104 patients with post-stroke cognitive impairment (PSCI) who were hospitalized in the Department of Neurology at a Grade A Level III general hospital (the top tier hospital in China) in Sichuan Province between October 2024 and October 2025 were enrolled in the study. Using a random number table, they were divided into a control group (n=52) and an intervention group (n=52), where the control group received conventional post-discharge care, while the intervention group received "hospital-community-home" three-tier collaborative post-discharge care. The effects of the two care interventions on patients' cognitive function, caregiver stress, and patients' activities of daily living were then compared. Results showed that there were no significant difference in MoCA scores, in CBI scores between the caregivers of patients and in MBI scores in the two groups at discharge ($P > 0.05$); however, at 3 months and 6 months post-discharge, the MoCA scores, the CBI scores, and the MBI scores of patients in the intervention group were all significantly higher than those in the control group ($P < 0.05$). In conclusion, "hospital-community-home" integrated continuity of care could effectively improve cognitive ability and self-care capacity in stroke patients with cognitive impairment and reduce caregiver burden, making it worthy of clinical implementation for patients' sake.

Keywords: "hospital-community-home" integrated continuity of care, stroke, cognitive impairment, cognitive function, caregiver burden

1. Introduction

Stroke is a syndrome characterized by focal or generalized brain dysfunction resulting from acute cerebral circulatory disorders. Based on its pathogenesis, it is primarily classified into ischemic stroke and hemorrhagic stroke. It is characterized by high incidence, high disability rates, high mortality, and high recurrence rates, and is one of the leading causes of death among the Chinese population (Sacco et al., 2013; Wang et al., 2023). Post-stroke cognitive impairment (PSCI) refers to a syndrome of newly emerging and persistent cognitive impairment following a stroke, encompassing a continuous spectrum of conditions ranging from mild cognitive impairment to dementia (El Husseini et al., 2023). In recent years, with continuous advancements in clinical emergency care and acute-phase treatment technologies, the acute-phase survival rate of stroke patients has significantly improved. However, the incidence of PSCI caused by the disease has also gradually increased, with a clinical prevalence as high as 39%–47% (Ma et al., 2025). It can affect multiple cognitive domains, including memory, attention, executive function, visuospatial dysfunction, and orientation (Nakling et al., 2017). Post-stroke cognitive impairment not only leads to a significant decline in patients' ability to perform activities of daily living and delays neurological and physical rehabilitation (Yu & Wang, 2024), but also increases the risk of adverse events such as wandering, falls, and aspiration, further exacerbating patients' physical and psychological distress (Kevdzija, 2022; Y. Lu et al., 2025; Whitney et al., 2019). At the same time, the long-term care needs of patients rely entirely on family caregivers, who lack professional training in cognitive impairment care. They must not only devote substantial time and energy to daily care but also manage behavioral and emotional issues stemming from the patient's cognitive impairment. The long-term stress of caregiving easily leads to physical exhaustion, psychological anxiety, and decision fatigue among caregivers, creating a dual dilemma of hindered patient recovery and an excessive burden on family caregivers (Franzén-Dahlin et al., 2025; Wu et al., 2019).

Currently, clinical stroke care primarily focuses on acute-phase interventions during the patient's hospital stay, with insufficient attention given to post-discharge continuity of care, resulting in a significant gap in the transition between inpatient and outpatient care (O'Callaghan et al., 2024). After discharge, community healthcare institutions face numerous challenges in providing community-based rehabilitation for stroke patients with cognitive impairment due to a lack of knowledge regarding post-stroke cognitive impairment, insufficient screening and assessment capabilities, scarcity of specialized intervention resources, and overly simplistic intervention models (Guo et al., 2021; Lin et al., 2021). Hospital-community-home integrated continuity of care is an innovative model that leverages medical or nursing consortia to integrate healthcare resources from community institutions and higher-level hospitals. It establishes an integrated nursing system featuring tiered collaboration, two-way referrals, and continuous services, providing patients with seamless, full-life cycle care spanning prevention, diagnosis, treatment, rehabilitation, and chronic disease management (Gao et al., 2022). This model breaks down institutional barriers in

traditional healthcare services, facilitates the decentralization of high-quality nursing resources, and implements tiered diagnosis and treatment. It provides patients with comprehensive, continuous, and personalized nursing services spanning from hospitalization to post-discharge, and from the community to the home. This model precisely addresses the long-term rehabilitation needs of stroke patients with cognitive impairment and is currently widely applied in post-hospital intervention for stroke patients (L. Lu et al., 2023), and in post-discharge care for breast cancer patients with PICC lines (Huang et al., 2023). Based on this, this study examines the clinical nursing needs and current status of post-discharge care for stroke patients with cognitive impairment. It explores the impact of hospital-community-home collaborative continuity of care on patients' cognitive function improvement and caregivers' burden. The study aims to provide empirical evidence and practical guidance for optimizing continuity of care plans for stroke patients with cognitive impairment, enhancing the quality of patient rehabilitation, alleviating family caregiving stress, and establishing an efficient hospital-community collaborative care system.

2. General Information & Methodology

This study is a prospective randomized controlled trial, in which the population consisted of patients with PSCI who were hospitalized in the Department of Neurology at a Grade A Level 3 general hospital in Sichuan Province between October 2024 and October 2025.

2.1 Inclusion Criteria

Patient Inclusion Criteria: (1) Meet the diagnostic criteria for stroke as outlined in the "Chinese Guidelines for the Diagnosis and Treatment of Acute Ischemic Stroke (2023)" (Chinese Society of Neurology & Chinese Society of Neurology Cerebrovascular Disease, 2024) or the "Chinese Guidelines for the Diagnosis and Treatment of Intracerebral Hemorrhage (2019)" (Chinese Society of Neurology & Chinese Society of Neurology Cerebrovascular Disease, 2019), and confirmed to have a stroke by cranial CT/MRI; (2) Meet the diagnostic criteria for PSCI (Post-Stroke Cognitive Impairment) as outlined in the "Expert Consensus on the Management of Post-Stroke Cognitive Impairment (2021)" (Wang & Dong, 2021), with a Montreal Cognitive Assessment (MoCA) score <26; exclude patients with severe cognitive impairment or dementia; and have a duration of cognitive impairment ≥3 months; (3) First-time stroke, with the condition in a stable phase, stable vital signs, no severe consciousness disorders such as coma or somnolence, and able to cooperate with cognitive function assessments, rehabilitation training, and nursing interventions; (4) Patients must be alert and able to cooperate with basic cognitive assessments; (5) Patients must reside long-term within the community served by this hospital, facilitating coordinated continuity of care such as community follow-ups and home care guidance, and must have a designated primary caregiver; (5) Both patients and their families must sign informed consent forms agreeing to participate in the hospital-community-home coordinated continuity of care intervention and be willing to cooperate with follow-up visits.

Inclusion Criteria for Caregivers: (1) Daily caregiving duration ≥4 hours, continuous caregiving period ≥1 month, and no frequent changes in caregivers; (2) Aged 18–70 years, with clear consciousness, normal mental status, no cognitive impairment, and normal

communication, comprehension, and executive functions; (3) Willing to voluntarily participate in the study's care training, follow-up surveys, and care burden scale assessments, with no resistance; (4) Free from severe physical illnesses and capable of independently providing daily care for the patient.

2.2 Exclusion Criteria

Patient Exclusion Criteria: (1) Patients with severe cardiac, hepatic, or renal insufficiency, malignant tumors, end-stage diseases, or other conditions with a life expectancy of less than 1 year; (2) Patients with other conditions that may cause cognitive impairment, such as traumatic brain injury, epilepsy, drug or alcohol dependence, thyroid dysfunction, or vitamin B12 deficiency; (3) Patients with severe mental disorders or aggressive behavior who are unable to cooperate with the intervention; (4) Patients with complete hemiplegia, quadriplegia, or severe physical functional impairment who are unable to cooperate with cognitive rehabilitation training and nursing procedures; (5) Patients who have received systematic cognitive rehabilitation training, specialized follow-up nursing interventions, or similar nursing services within the past 3 months; (6) Individuals for whom the full course of follow-up care and follow-up visits cannot be completed due to relocation, loss of contact, or other reasons, resulting in incomplete clinical data collection.

Caregiver Exclusion Criteria: (1) Individuals with severe physical illnesses or mental/psychological disorders who are unable to fulfill their caregiving responsibilities or cooperate with the study; (2) Individuals currently participating in other similar clinical care studies that may interfere with the results of this study; (3) Individuals who refuse to cooperate with the caregiving burden assessment, care training, or follow-up visits.

2.3 Dropout Standards

(1) Patients who experienced an acute exacerbation of their condition, died, or voluntarily withdrew from the study for personal reasons during the study period; (2) Patients who could not continue participation because their caregiver ceased providing care due to physical or family reasons, or because the caregiver was replaced during the study; (3) Patients who failed to participate in community follow-ups, home care guidance, or scale assessments in accordance with study requirements on two or more consecutive occasions and could not be contacted; (4) Cases with severe missing clinical data that cannot be included in the final statistical analysis are considered dropouts; dropout cases are excluded from the statistical analysis of the study results.

The study ultimately enrolled 104 subjects, who were divided into a control group (n=52) and an intervention group (n=52) using a random number table. The control group received conventional outpatient follow-up care, while the intervention group received "hospital-community-home" three-tiered coordinated follow-up care. Comparisons of demographic data, disease-related data, and general caregiver information between the two groups showed no statistically significant differences ($P > 0.05$), indicating clinical comparability.

Specific baseline data are as follows:

(1) General patient characteristics: among the 52 patients in the control group, 27 were male and 25 were female; ages ranged from 50 to 79 years, with a mean of (64.89 ± 6.51) years; educational level: 20 had a primary school education or lower, 21 had a junior high school education, and 11 had a high school education or higher; occupation: 32 were manual laborers and 20 were white-collar workers prior to retirement; stroke type: 39 cases of ischemic stroke and 13 cases of hemorrhagic stroke; duration of stroke: 3 weeks to 6 months, with a mean of (3.18 ± 2.09) months; severity of cognitive impairment: 35 cases of mild cognitive impairment and 17 cases of moderate cognitive impairment; comorbidities: 32 cases of hypertension, 23 cases of diabetes, and 11 cases of coronary heart disease. Among the 52 patients in the intervention group, 29 were male and 23 were female; age ranged from 52 to 78 years, with a mean of (65.34 ± 6.27) years; educational level: 18 had a primary school education or lower, 22 had a junior high school education, and 12 had a high school education or higher; occupation: 29 were manual laborers and 23 were white-collar workers prior to retirement; stroke type: 41 cases of ischemic stroke and 11 cases of hemorrhagic stroke; duration of stroke: 2 weeks to 6 months, with a mean of (3.42 ± 2.15) months; severity of cognitive impairment: 37 cases of mild cognitive impairment and 15 cases of moderate cognitive impairment; comorbidities: 34 cases of hypertension, 21 cases of diabetes, and 13 cases of coronary heart disease.

(2) General characteristics of caregivers: among the 52 caregivers in the control group, 14 were male and 38 were female; age ranged from 36 to 68 years, with a mean of (52.16 ± 5.34) years; educational level: 16 had a primary school education or lower, 24 had a junior high school education, and 12 had a high school education or higher; relationship to the patient: 28 were spouses, 21 were children, and 3 were other relatives; daily care duration: 6–12 hours, with a mean of (8.75 ± 1.62) hours; caregiving experience: 19 had prior caregiving experience, and 33 had none. In the intervention group, among 52 caregivers, there were 16 males and 36 females; ages ranged from 38 to 66 years, with a mean of (51.92 ± 5.47) years; educational level: 18 had a primary school education or lower, 22 had a junior high school education, and 12 had a high school education or higher; relationship to the patient: 26 were spouses, 23 were children, and 3 were other relatives; daily care duration: 5–13 hours, with an average of (8.61 ± 1.74) hours; caregiving experience: 21 had prior caregiving experience, and 31 had no prior caregiving experience.

2.4 The Control Group Received Standard Outpatient Follow-Up Care

(1) Health education: Tailored to the cognitive level and needs of patients and caregivers, this involved explaining the relationship between stroke and cognitive impairment, the characteristics of the disease course, and factors influencing prognosis. Emphasis was placed on the proper use of antiplatelet or anticoagulant medications, lipid-lowering drugs, and cognitive-enhancing medications. Dosage schedules and amounts were clearly labeled to prevent missed or excessive doses, and patients were informed of potential side effects and how to manage them. Instruct patients or caregivers on the correct daily monitoring of blood pressure, blood glucose, and other vital signs; advise patients to quit smoking, limit alcohol consumption, follow a low-salt, low-fat diet, and engage in regular exercise. (2) Systematic cognitive rehabilitation training: guide patients and caregivers to perform home-based

memory training, attention training, executive function training, and language and visuospatial training through methods such as watching videos and reading health education materials, to promote improvements in patients' cognitive function. (3) Activities of Daily Living (ADL) Training: In a safe environment, encourage and guide patients to perform self-care activities within their capabilities, such as washing, eating, and dressing. Use assistive devices during training, such as spill-proof bowls and dressing aids, and simplify the home environment by reducing the number of steps required for tasks. (4) Psychological and Behavioral Support: Promptly identify and address emotional issues such as depression, anxiety, and apathy in patients, and provide patient and caregivers with attentive listening and encouragement. For agitated or wandering behaviors, advise caregivers to use non-pharmacological interventions, such as guiding the patient to a safe area, redirecting their attention, and establishing a regular daily routine. (5) Safety precautions: Remove tripping hazards from the home, install handrails and non-slip mats, and secure electrical outlets and knives to prevent accidents such as falls, wandering, and accidental ingestion. (6) Regular Follow-ups: advise the patient or their companion to return periodically to the neurology department or memory clinic for follow-up evaluations of cognitive function, activities of daily living, and overall health. Based on the evaluation results, doctors, rehabilitation therapists, and nurses will collaboratively adjust the home care and rehabilitation plan. (7) Caregiver Support and Education: help caregivers understand the characteristics and progression of post-stroke cognitive impairment and establish realistic expectations. Provide guidance on how to communicate effectively with the patient, assist with rehabilitation exercises, and manage abnormal behaviors. Monitor their physical and mental stress, encourage them to utilize community resources to seek temporary care assistance, and maintain their own health.

2.5 The Intervention Group Implemented Integrated Continuity of Care Linking Hospitals, Communities, and Homes

Hospital Intervention Phase: (1) Multidimensional Assessment: Using the MoCA cognitive function scale and the Barthel Index, we accurately assess the severity of cognitive impairment, physical mobility, activities of daily living (ADL), psychological status, and control of underlying conditions. We collect information on the patient's home care environment, caregiver demographics, and medical history to establish a dedicated electronic continuity of care record. The file contents include assessment results, individualized rehabilitation plans, medication lists, key care points, and follow-up intervention plans, providing a solid basis for all nursing interventions. The file is subsequently synchronized with the community health service center to achieve information sharing among the three parties. (2) Cognitive and Physical Rehabilitation Training: ① Cognitive Training: Modular training targets on patients' attention, memory, executive function, orientation, and language skills. Attention training includes number-crossing exercises, identifying objects based on verbal instructions, and short-term concentration games; memory training focuses on object recognition, identifying family photos, retelling simple stories, and remembering daily schedules; executive function training enhances logical thinking through activities such as folding clothes, organizing items, and completing simple crafts step-by-step; orientation

training repeatedly reinforces awareness of time, place, and people using ward calendars, clocks, and environmental cues; patients with language impairments participate in articulation exercises and word-pairing drills. ② Physical Coordination Rehabilitation Training: to address hemiplegia and mobility limitations following a stroke, we conduct passive limb exercises, seated balance training, standing exercises, and simple walking drill to promote cerebral blood circulation. Meanwhile, we utilize physical rehabilitation to support cognitive recovery while enhancing patients' activities of daily living and thus reduce the burden on family caregivers. (3) Specialized Caregiver Training: Training is provided through daily one-on-one targeted guidance, distribution of illustrated training manuals, and simple rehabilitation videos. Training content includes core principles of caring for patients with stroke-related cognitive impairment, practical procedures for home-based cognitive rehabilitation, medication management techniques, and safety measures for fall prevention/prevention of wandering/aspiration, techniques for managing abnormal patient emotions, recognition of stroke recurrence warning signs and emergency response procedures, and principles of home nutrition planning. Following the training, caregivers' practical skills are assessed on-site, and repeated guidance is provided for areas of weakness to ensure they can independently perform home care tasks and prevent the patient's condition from worsening due to improper care. (4) Routine WeChat Supervision: establish dedicated WeChat groups for continuity of care linking the hospital, community, and patients. Group members include responsible nurses and rehabilitation therapists from the hospital and community healthcare facilities, attending physicians, patients, and 1–2 core caregivers. Daily updates in the group include the patient's rehabilitation plan and training priorities for the day, reminders for caregivers to coordinate with hospital care, real-time answers to questions regarding nursing, rehabilitation, and medication, as well as brief tips on cognitive rehabilitation and disease-related health education. Caregivers are also encouraged to document the patient's daily cognitive and behavioral performance to facilitate adjustments to intervention plans by medical staff. (5) Regular Expert Outreach Clinics: a multidisciplinary expert team comprising a chief physician from the Department of Neurology, a senior rehabilitation therapist from the Department of Rehabilitation, a geriatric specialist, and a psychiatrist is formed to conduct regular outreach clinics in the patients' communities. (6) Pre-discharge Coordination and Transition: one day prior to discharge, a multidisciplinary team conducts a joint discharge assessment to re-evaluate the patient's cognitive and physical functions and finalize the continuity of care documentation. The documentation, rehabilitation plan, medication list, and care guidelines are shared with the corresponding community health service center to ensure seamless information and personnel handover between the hospital and the community. Caregivers are provided with a discharge follow-up contact card specifying the schedule for community follow-ups and hospital readmission appointments. A final intensive training and education session is conducted prior to discharge to reiterate the core principles of home care, rehabilitation, and safety, ensuring a smooth transition to the community-home care model after discharge and achieving seamless continuity of care throughout the entire process.

Community Intervention Phase: (1) Regular Follow-ups and Dynamic Adjustments: based on patient records, rehabilitation plans, medication lists, and care guidelines, conduct home

visits or outpatient follow-ups 1 week, 1 month, 3 months, and 6 months after discharge. Re-evaluate scales such as the MoCA and dynamically adjust care plans. Monitor physical function, medication adherence, and potential home safety hazards to provide timely warnings of cognitive decline and stroke recurrence. (2) Structured Cognitive Rehabilitation Training: led by community nurses or rehabilitation therapists, this program continues the rehabilitation plan established in the hospital, providing patients with stepwise cognitive rehabilitation and physical training. Training content includes attention, memory, executive function, language skills, sitting, standing, and walking. (3) Activities of Daily Living and Social Support: conduct practical training at community day-care centers, such as simulated cooking and laundry, to gradually improve independence. Organize group activities for patients with cognitive impairment to stimulate cognition through interaction, and encourage participation in community lectures to enhance a sense of belonging. (4) Comorbidity Management and Risk Control: conduct regular home or in-hospital visits to monitor patients' blood pressure and blood glucose levels, ensure adherence to medication schedules, and guide patients toward a low-salt, low-fat diet. Remain vigilant for the onset of various complications, and promptly refer patients to higher-level hospitals via the green channel should their condition deteriorate. (5) Development of a Caregiver Support System: establish mutual-aid groups for family caregivers and regularly conduct training sessions on caregiving skills and experience-sharing.

Home Intervention Phase: (1) Daily Life-Based Cognitive Stimulation Training: community healthcare workers guide caregivers in incorporating cognitive training into daily routines, such as helping patients to tell time, keep track of schedules, calculate expenses on grocery shopping, and manage household chores, thereby integrating training into real-life scenarios. Nostalgia therapy is implemented to slow the decline of long-term memory by looking at old photographs and recounting past experiences. (2) Structured Daily Care: with the assistance of community healthcare providers, help patients establish a fixed daily schedule to maintain a regular sleep rhythm and reduce sleep-wake reversal. Encourage daily light physical activity, such as walking and joint exercises, to promote cerebral blood circulation. (3) Medication and Nutritional Care: administer medications strictly according to medical instructions—on time and in the correct dosage—while monitoring for adverse drug reactions and promptly reporting any issues to the community or hospital. Regarding diet, guide caregivers to increase the patient's intake of high-quality protein, unsaturated fatty acids, and fruits and vegetables, while limiting high-salt and high-fat foods. (4) Detailed home safety care: instruct caregivers to assist the patient in wearing anti-wandering devices and avoid leaving the patient alone. Simplify the use of tableware and appliances to prevent accidents such as burns and electric shocks. (5) Emotional Support at Home: advise caregivers to provide patient companionship and positive encouragement, avoid criticism and impatience, and uphold the patient's self-esteem. Encourage the patient to participate in age-appropriate household chores to enhance their sense of self-worth.

2.6 Observation Measures

2.6.1 Patient Cognitive Function

The Montreal Cognitive Assessment (MoCA) (Nasreddine et al., 2005) was used to evaluate cognitive function in both groups at discharge, 3 months post-discharge, and 6 months post-discharge. Developed in Montreal in 1996 by Canadian neurologist Ziad S. Nasreddine, the scale consists of seven sections: visuospatial and executive functions (5 points), naming (3 points), attention and calculation (6 points), language (3 points), abstract reasoning (2 points), delayed memory (5 points), and orientation (6 points). The total score ranges from 0 to 30 points; a score above 26 indicates normal cognition, 19–25 suggests mild cognitive impairment, and a score below 19 indicates possible dementia. The scale's Cronbach's α coefficient ranges from 0.78 to 0.83, demonstrating high content and construct validity.

2.6.2 Caregiver Burden

The Caregiver Burden Index (CBI) (Shafiezadeh et al., 2020) was used to assess caregiver burden in both patient groups at discharge, 3 months post-discharge, and 6 months post-discharge. This scale was developed by Novak and Guest in the United States in 1989. The scale comprises five dimensions: time-related burden (5 items, score range 0–20), developmental burden (5 items, score range 0–20), physical burden (4 items, score range 0–16), social burden (5 items, score range 0–20), and emotional burden (5 items, score range 0–20 points). It comprises a total of 5 dimensions and 24 items, with a total score ranging from 0 to 96 points. A score of 0–32 indicates mild burden, 33–64 indicates moderate burden, and 65–96 indicates severe burden. The Cronbach's alpha coefficients for the scale range from 0.74 to 0.90.

2.6.3 Patients' Activities of Daily Living (ADL)

The Modified Barthel Index (MBI) (Pournajaf et al., 2023) was used to assess the patients' ability to perform activities of daily living at discharge, 3 months post-discharge, and 6 months post-discharge. This scale was modified in 1989 by Shah S., Vanclay F., and Cooper B. based on the original BI, refining the scoring levels and enhancing assessment sensitivity. It is currently the most widely used ADL assessment scale in the global rehabilitation and nursing fields. The scale includes 10 items such as eating, dressing, bathing, and walking, with a total score ranging from 0 to 100; a higher score indicates greater self-care ability. The scale has a Cronbach's alpha coefficient ranging from 0.87 to 0.92, demonstrating high content and construct validity.

2.7 Statistical Methods

All data were analyzed using SPSS 26.0 statistical software. Continuous variables were tested for normality using the Shapiro-Wilk test; data conforming to a normal distribution are presented as ($\bar{x} \pm s$). Comparisons between groups were performed using the independent samples t-test. Data not conforming to a normal distribution are presented as [M (P25, P75)]; comparisons between groups were performed using the Mann-Whitney U test. Categorical data are presented as frequency (percentage) [n (%)]. Comparisons between groups were

performed using the chi-square test or Fisher's exact test (when the expected frequency was <5). The significance level was set at $\alpha = 0.05$, and $P < 0.05$ was considered statistically significant.

3. Results

A comparison of cognitive function in both groups at discharge, 3 months post-discharge, and 6 months post-discharge revealed that the MoCA scores of patients in the intervention group at discharge did not differ significantly from those in the control group ($P > 0.05$). However, the MoCA scores at 3 months and 6 months post-discharge were significantly higher in the intervention group than those in the control group ($P < 0.05$), as shown in Table 1.

Table 1. Comparison of MoCA Scores Between the Two Groups ($\bar{x} \pm s$): Points

Group	Number of cases	At discharge	3 months after discharge	6 months after discharge
Control group	52	19.71±2.54	21.61±2.67	23.07±1.46
Intervention group	52	19.42±3.03	24.52±1.74	26.15±1.86
t		0.529	6.584	9.393
P		0.598	0.000	0.000

A comparison of caregiver burden between the two groups revealed no significant difference in CBI scores at discharge ($P > 0.05$). However, at 3 months and 6 months post-discharge, the CBI scores of caregivers in the intervention group were significantly higher than those in the control group ($P < 0.05$), as shown in Table 2.

Table 2. Comparison of CBI Scores Among Caregivers in The Two Groups ($\bar{x} \pm s$): Points

Group	Number of cases	At discharge	3 months after discharge	6 months after discharge
Control group	52	65.23±3.74	52.78±2.52	42.16±4.26
Intervention group	52	64.48±3.69	43.87±3.38	31.76±2.65
t		1.029	15.240	14.948
P		0.306	0.000	0.000

A comparison of the patients' activities of daily living (ADL) revealed no significant difference in MBI scores between the two groups at discharge ($P > 0.05$). However, at 3 months and 6 months post-discharge, the MBI scores of patients in the intervention group were significantly higher than those in the control group ($P < 0.05$), as shown in Table 3.

Table 3. Comparison of MBI Scores Between the Two Groups ($\bar{x} \pm s$): Points

Group	Number of cases	At discharge	3 months after discharge	6 months after discharge
Control group	52	44.23±1.64	50.23±4.26	70.25±3.57
Intervention group	52	44.98±2.04	63.82±3.52	81.45±4.23
t		2.066	17.734	14.591
P		0.041	0.000	0.000

4. Discussion

4.1 Integrated Hospital-Community-Home Continuity of Care Could Effectively Improve Cognitive Function in Stroke Patients with Cognitive Impairment

Cognitive impairment following stroke is a common neurological complication, and cognitive rehabilitation is characterized by its long-term and gradual nature (Shi et al., 2021). Traditional, hospital-centric care models suffer from shortcomings such as interrupted rehabilitation interventions after discharge, a lack of professional guidance for home care, and fragmented rehabilitation training, making it difficult to meet patients' long-term cognitive rehabilitation needs. In contrast, hospital-community-home collaborative continuity of care, via establishing a full-cycle, seamless, and multi-stakeholder collaborative care system, has emerged as an effective model for improving the cognitive abilities of these patients (Yu et al., 2021). In this study, the implementation of hospital-community-home collaborative continuity of care effectively improved the cognitive abilities of stroke patients with cognitive impairment. The primary reasons could be as follows: First, this collaborative model achieves comprehensive care coverage for stroke patients with cognitive impairment from the acute phase, through the recovery phase, to the home rehabilitation phase. The hospital, serving as the professional core, conducts precise cognitive function assessments during the patient's hospitalization. Based on impairments across multiple cognitive domains—including attention, memory, executive function, and orientation—it develops personalized, specialized cognitive rehabilitation plans. Concurrently, caregivers receive systematic training in caregiving skills and cognitive training methods, ensuring a smooth transition to rehabilitation prior to discharge and laying a professional foundation for subsequent home-based cognitive rehabilitation. The community serves as an intermediate hub, playing a central role in providing continuous follow-up, dynamic monitoring, and on-site guidance. Through regular home visits, community-based rehabilitation guidance sessions, and dynamic health monitoring, the community team tracks patients' cognitive recovery progress, physical condition, and the occurrence of complications in real time. They promptly coordinate with the hospital to adjust rehabilitation plans, resolve practical challenges in home-based rehabilitation, prevent gaps in rehabilitation interventions, and ensure the continuity and standardization of cognitive training. The home serves as the primary setting for cognitive rehabilitation. Under professional guidance, cognitive training is integrated into patients' daily lives. Through context-based cognitive stimulation exercises, neural plasticity in the brain is continuously stimulated. Meanwhile, the emotional support and psychological comfort provided by family members effectively alleviate post-stroke

anxiety, depression, and other negative emotions, thereby enhancing patients' motivation and adherence to rehabilitation training. Furthermore, this collaborative model breaks down information barriers between hospitals, communities, and families, forming a closed-loop intervention process of "Professional Assessment—Plan Formulation—Home Implementation—Dynamic Adjustment—Optimization and Reinforcement", thereby avoiding standardized and haphazard rehabilitation training. This enables precise interventions tailored to different stages of the patient's recovery. Continuous and regular cognitive stimulation effectively promotes the repair and compensation of damaged neural functions, slows the progression of cognitive impairment, and gradually improves the patient's overall cognitive functions. Therefore, the hospital-community-home collaborative continuity of care aligns with the core long-term rehabilitation needs of stroke patients with cognitive impairment. Through the synergistic efforts of professional support, community coordination, and family implementation, it provides a multidimensional foundation for the recovery of patients' cognitive functions—encompassing physiological, psychological, and rehabilitative interventions—thereby improving the cognitive abilities of this patient population, which is consistent with the findings of Cai et al. (2021).

4.2 Integrated Care Linking Hospitals, Communities, and Families Could Effectively Reduce the Caregiving Burden on Caregivers of Stroke Patients with Cognitive Impairment

Due to cognitive decline and loss of activities of daily living, patients with cognitive impairment following stroke require long-term and intensive care from their caregivers. This places caregivers at high risk of physical exhaustion, psychological anxiety, and difficulties adapting to their new social roles. Caregiver stress has become a significant factor limiting the quality of post-discharge rehabilitation for these patients (Li & Yang, 2024). In this study, the implementation of a hospital-community-home collaborative continuity of care model effectively alleviated caregiver stress. This was primarily due to the model's reliance on the hospital as a professional backbone, which provided caregivers with systematic training in caregiving skills and cognitive rehabilitation guidance, thereby enhancing their professional competence and eliminating the feelings of helplessness and psychological burden caused by a lack of caregiving knowledge from the root. Meanwhile, with the community serving as a connecting hub, services such as home visits and day-care help alleviate the physical and time burdens on caregivers, providing them with respite and breaking the isolation of single-family caregiving. At the same time, the community's management of comorbidities and risk control enables early warning of fluctuations in the patient's condition and the risk of cognitive decline, reducing the stress caregivers face when dealing with emergencies alone. The model's accompanying psychological counseling and peer support services effectively alleviate caregivers' negative emotions and strengthen their social support systems. As patients' cognitive function and activities of daily living gradually improve under the continuous care intervention, the difficulty of care continues to decrease, creating a virtuous cycle of patient rehabilitation and reduced caregiving pressure. Therefore, through hospital-community-family collaboration in continuous care—leveraging professional empowerment, resource integration, and multi-party coordination—physical, psychological, and social pressures on caregivers are comprehensively alleviated. This approach not only

safeguards the physical and mental health of caregivers but also maintains the stability of the long-term care system, effectively reducing the psychological stress experienced by caregivers.

4.3 Integrated Hospital-Community-Home Continuum of Care Could Effectively Enhance Self-Care Abilities of Stroke Patients with Cognitive Impairment

Stroke patients with cognitive impairment often experience concomitant physical disabilities and cognitive decline. The recovery of their activities of daily living (ADL) is a long-term and dependent process. Traditional fragmented care models can easily lead to interruptions in rehabilitation interventions and a lack of continuity in training, severely limiting improvements in patients' self-care abilities (Zhang et al., 2025). In this study, the hospital-community-home collaborative continuity of care model established a full-cycle, seamlessly integrated rehabilitation and nursing system, providing systematic support for enhancing patients' self-care abilities and facilitating their effective recovery. The primary reason lies in the model's hospital-centered professional core: during hospitalization, comprehensive assessments of self-care abilities and cognitive function are conducted, and personalized rehabilitation plans are developed to include training in basic activities of daily living (such as eating, dressing, personal hygiene, and walking) as well as cognitive support exercises, thereby laying a professional foundation for post-discharge rehabilitation continuity. With the community serving as an intermediate hub, regular follow-ups and community-based rehabilitation training are used to dynamically assess progress in self-care recovery and adjust intervention strategies, effectively preventing gaps in rehabilitation care. By centering the home as the primary rehabilitation setting, professional rehabilitation training is organically integrated into patients' daily lives. Through scenario-based, routine self-care exercises, we greatly mobilize patients' initiative. At the same time, by relying on the constant accompaniment and supervision of caregivers, we ensure the continuity and standardization of training, continuously stimulating neural functional compensation and limb functional recovery. Therefore, the hospital-community-home collaborative continuity of care integrates the professional strengths of the hospital, the transitional advantages of the community, and the contextual benefits of the home altogether. Through comprehensive, personalized, and routine rehabilitation interventions, it comprehensively promotes the recovery of self-care abilities in stroke patients with cognitive impairment.

5. Summary and Outlook

The hospital-community-home collaborative model of continuity of care bridges the gap between inpatient and home-based care, establishing a full-cycle care chain that integrates acute-phase specialized hospital intervention, precise community-based rehabilitation, and sustained home-based care. By consolidating resources from specialized hospital nursing, basic community nursing, and family care, and through measures such as multidisciplinary collaboration, dynamic assessment, individualized intervention, and comprehensive follow-up, this model could address the shortcomings of discontinuous and fragmented care inherent in single-model approaches. It not only provides patients with continuous, standardized, and targeted cognitive rehabilitation care, i.e. improving their cognitive

impairment and enhancing their self-care abilities, but also systematically empowers caregivers, thereby reducing their caregiving burden. This model aligns with the clinical needs for long-term rehabilitation of stroke patients with cognitive impairment, optimizes the allocation of medical resources, and reduces long-term healthcare costs. It holds significant clinical and social value and provides a practical reference for establishing a continuity of care system for stroke patients with cognitive impairment.

However, the rehabilitation of cognitive impairment following stroke is a long-term and complex process. Although the hospital-community-home collaborative continuity of care model—as a new approach aligned with the concept of tiered diagnosis and treatment—achieved ideal intervention outcomes in this study, there remains significant room for improvement in terms of comprehensive clinical implementation, in-depth research, and model optimization and upgrading. Future research should expand the sample size and conduct multicenter, large-scale, long-term follow-up cohort studies to extend the intervention and follow-up periods, thereby investigating the long-term effects of this care model on patients' cognitive function and caregiving burden. Besides, by integrating information technologies such as "Internet Plus" healthcare, remote monitoring, and smart rehabilitation devices, an integrated smart nursing platform linking hospitals, communities, and homes should be established to enable real-time monitoring of patients' cognitive function and rehabilitation progress, as well as remote guidance, thereby overcoming geographical and temporal constraints. Moreover, collaboration processes among hospitals, community health service centers, and families should be further streamlined to establish routine referral, information-sharing, and joint follow-up mechanisms, thereby promoting seamless integration of nursing services across all three sectors.

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