

# The Effect of an Empowerment-Based Health Management Program within a Medical Consortium Framework on Secondary Prevention of Stroke

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**Abstract:** Objective: To explore the impact of an empowerment-based health management program, implemented within a medical consortium framework, on secondary prevention for stroke patients. Methods: Stroke patients admitted to our hospital and its medical group were included in the study. They were randomly divided into two groups: a control group of 98 cases and an experimental group of 101 cases. The control group received conventional treatment and nursing propaganda and education, while the experimental group received an empowerment-based health management program within the medical consortium framework. Stroke recurrence hospitalization rates, self-efficacy scale scores, stroke patient empowerment nursing assessment scale scores, and medication adherence between the two groups were analyzed and compared. Results: After six months, the stroke recurrence hospitalization rate was significantly higher in the control group than in the experimental group ( $P<0.05$ ). The experimental group demonstrated significantly higher self-efficacy scores than the control group ( $P<0.05$ ). The stroke patient empowerment nursing assessment scale scores in the experimental group increased ( $P<0.05$ ). The experimental group showed higher Patient Activation Measure (PAM) scores compared to the control group ( $P<0.05$ ). The experimental group exhibited higher Medication Adherence Scale-8 (MMAS-8) scores compared to the control group ( $P<0.05$ ). Conclusion: The empowerment-based health management program within the medical consortium framework effectively enhances secondary prevention outcomes for stroke patients. Through the integration of healthcare resources, provision of personalized health management plans, and reinforcement of patient education, this program enhances patients' self-management capabilities, promotes medication adherence, and encourages positive lifestyle changes. As a result, it reduces the recurrence rate of strokes and the risk of complications. The empowerment-based health management program within the medical consortium framework holds significant potential for enhancing chronic disease management.

**Keywords:** Medical Consortium Model, Empowerment-Based Health Management Program, Stroke, Secondary Prevention

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## 1. Introduction

Stroke is a common and debilitating neurological disorder, imposing significant adverse effects on the physical and mental health [1], as well as the quality of daily life for affected individuals, posing a significant health challenge globally, with over 8 million acute cases reported annually in

China alone [2]. The economic impact is substantial, with healthcare expenditures exceeding 40 billion Renminbi (RMB) annually, underscoring the critical need for effective poststroke rehabilitation [3]. Regrettably, it has emerged as a leading cause of mortality, demanding urgent attention to address its repercussions on public health. Self-management interventions grounded in empowerment principles, when applied to chronic conditions like diabetes, asthma,

hypertension, and arthritis, have demonstrated efficacy in influencing behavioral patterns and health-related outcomes [4, 5]. Effective secondary prevention measures in stroke can significantly reduce the recurrence rate and disability [6]. Nevertheless, there are still challenges and issues in the secondary prevention and management of stroke patients. Hence, understanding the current state of self-management in stroke patients is crucial for formulating effective secondary prevention strategies. The establishment of a healthcare management system within a medical consortium, focusing on families and community-based care with guidance from hospitals, is essential in improving the effectiveness of secondary prevention in stroke patients. This study aims to implement an empowerment-based health management program for stroke patients and comprehensively assess its impact on indicators such as stroke recurrence hospitalization rates, self-efficacy, empowerment, healthcare compliance, and adherence. This research will provide a scientific basis for future stroke management strategies.

## 2. Materials and Methods

### 2.1. Study Setting and Participants

This investigation involved patients with stroke treated at Guangzhou Integrated Traditional Chinese and Western Medicine Hospital and its medical consortium from April 1, 2021, to July 30, 2022. Patients were included in the study using a randomized controlled experimental design, resulting in 98 cases in the control group and 101 cases in the experimental group. This study strictly adhered to ethical principles and legal regulations, ensuring the protection of patient privacy and personal information security. Informed consent was obtained from patients during the research process, and their participation was voluntary, with the option to withdraw from the study at any time. Research data were anonymized and used exclusively for research purposes to guarantee data security and confidentiality. Diagnostic Criteria: The Western medicine diagnostic criteria for stroke referred to the "Diagnostic Key Points for Various Major Cerebrovascular Diseases in China 2019" [7] formulated by the Neurology Branch of the Chinese Medical Association in 2019. Inclusion Criteria: (1) Compliance with Western medicine diagnostic criteria; (2) Age between 18 and 85 years; (3) Patients whose condition has stabilized and who have no severe complications after clinical standard treatment; (4) Informed consent from patients and their families. Exclusion and Termination Criteria: (1) Patients unable to complete treatment or questionnaire due to conditions such as severe mental illness or cognitive impairment; (2) Patients with end-stage malignancies, blood disorders, gastrointestinal diseases, renal failure, or other advanced chronic illnesses; (3) Patients participating in other clinical trials. Termination Criteria: (1) Significant deterioration of the patient's condition during treatment, such as myocardial infarction or severe heart failure; (2) Loss to follow-up after patient discharge, rendering continued treatment or assessment unfeasible.

### 2.2. Intervention Methods

All patients included in this study received routine treatment in accordance with the "2010 Chinese Guidelines for Cerebrovascular Diseases" [8]. Both groups of study subjects received standard drug therapy and rehabilitation training.

#### 2.2.1. Control Group Intervention Plan

In addition to standard treatment, the control group received routine health education, established stroke records, and underwent telephone follow-ups after discharge at monthly intervals. An effectiveness evaluation was conducted at 6 months post-enrollment.

#### 2.2.2. Experimental Group Intervention Plan

Based on a review of domestic and international literature and expert consultations [9], an empowerment-based health management program for stroke patients was developed within a medical consortium framework. The program consisted of three models of health management: (1) Standard management model for stroke patients, established by referencing domestic and international literature. (2) Development of an electronic follow-up record for stroke patients using an information technology platform. (3) Establishment of a healthcare management model centered around advanced stroke centers, focusing on family units, community management, and hospital guidance.

The program followed five fundamental empowerment theory steps: problem identification, emotional expression, goal setting, action planning, and evaluation of outcomes. Expert consultations and pre-trials were conducted to construct the stroke patient empowerment-based health management program. The specific intervention process is outlined below:

(1) Formation of a Consortium Empowerment Management Team: The Consortium Empowerment Management Team was comprised of three senior hospital physicians, a nursing discipline leader, four head nurses or above, and one nursing master from tertiary hospitals, as well as specialized medical and nursing personnel from the patient's community. A stroke patient peer support club and WeChat group were established to facilitate synchronous information exchange among healthcare providers, patients, and their families. Additionally, an online platform was established for seamless hospital-community-home linkages, facilitating real-time patient health status management through shared health records.

(2) Empowerment Health Management Intervention: The experimental group of patients underwent an empowerment-based health management program within the medical consortium model. The intervention was divided into five phases based on the five fundamental empowerment steps:

Phase 1 (within 2 days of patient admission): Evaluate patient needs, assist patients in problem identification, emotional expression, and goal setting. The "Stroke Empowerment Health Management Manual" was distributed

to patients on the first day of hospitalization, and a single empowerment management session was conducted to guide patients in expressing their thoughts and identifying health issues and goals.

Phase 2 (during the patient's hospital stay): Emphasis was placed on motivating patient self-initiative and self-management. Patients developed appropriate action plans, and electronic health records were established during their hospital stay. Patients received empowerment health education twice a week, following the five fundamental empowerment steps.

Phase 3 (1 month postdischarge): The empowerment health management program continued, utilizing a stroke electronic follow-up system and WeChat platform. Scheduled online follow-ups occurred weekly to assess the patient's self-management status at home. Based on the patient's questions and difficulties during the action process, achievable goals and practical action plans were set, and plans were adjusted in a timely manner. The WeChat platform was used for shared communication with the patients.

Phase 4 (2-3 months postdischarge): Weekly scheduled online follow-ups continued. Community nurses conducted face-to-face follow-ups, and the patient's progress was evaluated and plans were adjusted as necessary. The empowerment management team guided the patient in completing new goals and plans.

Phase 5 (4-6 months postdischarge): Monthly scheduled online follow-ups continued, with monthly face-to-face follow-ups conducted by community nurses. Data obtained were updated in the patient's health management record, and doctors adjusted the rehabilitation plan based on the patient's latest condition, notifying the patient for any necessary hospital check-ups.

### 2.3. Outcome Measures

The effectiveness of both groups of patients was assessed at baseline and at 1 month, 3 months, and 6 months after enrollment using the following outcome measures:

**Stroke Recurrence Hospitalization Rate:** This refers to the rate of hospitalization due to a new stroke occurring within six months after intervention for both groups of patients.

**Self-Efficacy Scale (Chinese version)** [10]: This scale is utilized to assess the self-efficacy of patients. The total score is the average of individual item scores, with each item rated on a scale of 1 to 4. The total score ranges from 10 to 40, with higher scores indicating higher self-efficacy.

**Stroke Patient Empowerment Care Evaluation Scale (ECES)** [11]: This scale assesses the perception of empowerment in stroke patients. It includes four dimensions and 19 items, with a total score ranging from 19 to 57. Higher scores indicate a stronger perception of empowerment in patients. This scale effectively evaluates patients' empowerment perception levels

in these four dimensions.

**Patient Activation Measure (PAM)** [12]: The Chinese version of the PAM is used to assess the level of patient activeness in disease management. The scale consists of 13 items and is scored using a Likert 5-point rating scale, ranging from 0 to 4, representing "not applicable" to "strongly agree." Scores for all items are summed and then converted to a PAM score according to a scoring chart, with total scores ranging from 0 to 100. Higher scores indicate a higher level of patient activeness in disease management.

**Morisky Medication Adherence Scale (MMAS-8)** [13]: Medication adherence is assessed using the MMAS-8. The scale has a maximum score of 21 and a minimum score of 1. Higher scores indicate greater medication adherence.

### 2.4. Data Processing and Statistical Analysis

Data analysis was conducted using SPSS 23.0 statistical software. Descriptive data were expressed as mean  $\pm$  standard deviation ( $\bar{x} \pm s$ ) for continuous variables. If the data followed a normal distribution, a t-test was employed; otherwise, the Mann-Whitney U test was used. Categorical and ordinal data were presented as percentages (%). The chi-squared test was used for the comparison of categorical data, and the Mann-Whitney U test was applied for ordinal data. All statistical tests were two-tailed, and a P-value  $<0.05$  was considered statistically significant.

## 3. Results

### 3.1. Rehospitalization Rate

Within 6 months of intervention, the control group of stroke patients had a higher rehospitalization rate for stroke compared to the experimental group, and this difference was statistically significant ( $P < 0.05$ ), as shown in Table 1.

**Table 1.** Comparison of Rehospitalization rate (%).

Group	N	Rehospitalization rate
Control group	98	15 (15.31)
Experiment group	101	6 (5.94)
$\chi^2$		4.622
P		0.032

### 3.2. Self-Efficacy Scale (Chinese Version)

There was no statistically significant difference in self-efficacy scores between the control group and the experimental group before the intervention ( $P > 0.05$ ). However, after 6 months of intervention, the self-efficacy scores in the experimental group were significantly higher than those in the control group, and this difference was statistically significant ( $P < 0.05$ ). This indicates that the health management program can enhance the self-efficacy of stroke patients, as shown in Table 2.

**Table 2.** Comparison of Self-efficacy Scale ( $\bar{x} \pm s$ ).

Group	N	Baseline	1 month after enrollment	3 months after enrollment	6 months after enrollment
Control group	98	24.20 $\pm$ 2.61	24.06 $\pm$ 2.83	25.91 $\pm$ 2.25	26.89 $\pm$ 2.47
Experiment group	101	24.11 $\pm$ 2.63	24.72 $\pm$ 2.49	28.30 $\pm$ 91	29.66 $\pm$ 2.47

Group	N	Baseline	1 month after enrollment	3 months after enrollment	6 months after enrollment
<i>t</i>		0.158	0.63	-2.25	-1.88
<i>P</i>		0.875	0.53	0.01	0.04

### 3.3. Stroke Patient Empowerment Care Evaluation Scale

At 3 months and 6 months after the intervention, the scores on the Empowerment Care Evaluation Scale increased in the

experimental group of stroke patients and were higher than those in the control group, with statistically significant differences ( $P < 0.05$ ), as shown in Table 3.

**Table 3.** Comparison of Empowerment Care Evaluation Scale ( $\bar{x} \pm s$ ).

Group	N	Baseline	1 month after enrollment	3 months after enrollment	6 months after enrollment
Control group	98	30.32±2.95	32.06±2.01	33.72±1.88	33.89±2.66
Experiment group	101	30.68±3.00	31.84±2.22	35.18±2.09	36.04±2.17
<i>t</i>		-0.60	0.51	-8.71	-10.46
<i>P</i>		0.54	0.60	0.00	0.00

### 3.4. Patient Activation Measure

There was no statistically significant difference in PAM scores between the two groups before enrollment ( $P > 0.05$ ). However, after 3 months and 6 months of enrollment, the

PAM scores in the experimental group were higher than those in the control group, and this difference was statistically significant ( $P < 0.05$ ), as shown in Table 4.

**Table 4.** Comparison of Patient Activation Measure ( $\bar{x} \pm s$ ).

Group	N	Baseline	1 month after enrollment	3 months after enrollment	6 months after enrollment
Control group	98	53.62±1.85	54.00±1.66	56.5±1.59	58.02±1.59
Experiment group	101	53.63±1.72	53.65±1.57	59.70±2.96	64.39±5.87
<i>t</i>		-0.02	1.09	-6.75	-7.11
<i>P</i>		0.98	0.28	0.00	0.00

### 3.5. Morisliy Medication Adherence Scale

There was no statistically significant difference in MMAS-8 scores between the two groups before enrollment ( $P > 0.05$ ). However, after 3 months and 6 months of

enrollment, the MMAS-8 scores in the experimental group were higher than those in the control group, and this difference was statistically significant ( $P < 0.05$ ), as shown in Table 5.

**Table 5.** Comparison of MMAS-8 ( $\bar{x} \pm s$ ).

Group	N	Baseline	1 month after enrollment	3 months after enrollment	6 months after enrollment
Control group	98	12.6±1.69	13.34±1.89	15.30±2.22	15.80±2.85
Experiment group	101	12.47±1.74	13.64±1.68	17.29±2.22	17.88±2.68
<i>t</i>		0.378	-0.862	-4.517	-3.778
<i>P</i>		0.706	0.391	0.000	0.000

## 4. Discussion

The importance of establishing a stroke patient empowerment health management model based on a medical consortium is paramount. The medical consortium model represents a comprehensive healthcare service approach, involving collaborative efforts between hospitals, community healthcare service centers, and family physicians to deliver continuous and personalized medical care [14]. The empowerment health management model, on the other hand, is an innovative concept designed to encourage self-care through the cooperation of healthcare professionals, patients, and their families. This innovative model seeks to enhance the quality of life for patients with chronic illnesses and promote overall well-being. Its core philosophy revolves around the

empowerment of patients, boosting their self-confidence, and enhancing their ability to make autonomous decisions with the ultimate goal of self-improvement and health promotion [15].

In the 2015 "Guidance on Promoting the Construction of the Graded Diagnosis and Treatment System" issued by the General Office of the State Council, it was emphasized that advancing the graded diagnosis and treatment system can optimize the allocation of medical resources, improve the efficiency of medical services, reduce the financial burden of healthcare costs, and enhance the quality of medical services. This, in turn, better caters to the basic medical needs of the general population [16]. The medical consortium model entails the establishment of cooperative relationships between medical institutions of varying levels and types. Together, they provide medical services, fostering the integration and sharing of medical resources, and serve as a pivotal platform for implementing the graded diagnosis

and treatment system. Many stroke patients often do not achieve complete functional recovery before discharge and require prolonged rehabilitation. Therefore, the medical consortium model ensures that stroke patients receive rapid emergency treatment and diagnosis during the acute phase, all the while ensuring the rational allocation of medical resources. Through the integration of medical resources and information sharing within the medical consortium model, a standardized and continuous healthcare and nursing support system can be provided to stroke patients [17].

Incorporating the concept of patient empowerment within the framework of a medical consortium for stroke patients demonstrates a sound and scientifically grounded approach. This method underscores the significance of placing elderly patients in the center of healthcare decision-making, with healthcare providers and family members playing the role of facilitators. This approach has been increasingly applied in the care of various acute and chronic conditions in recent years and has yielded significant results [18]. It emphasizes understanding patients' psychological and emotional states, listening to their accounts of their illnesses, jointly devising rehabilitation plans, problem-solving, and helping patients take control of their health by fostering self-determination [19, 20]. Patients are encouraged to actively acquire disease-related knowledge to enhance their self-management skills. The patient empowerment health management model stresses patient engagement and self-management abilities. By boosting patients' self-efficacy and encouraging them to actively participate in health-related activities and decision-making, the model aims to promote self-health management [21, 22].

This study combines the medical consortium model with the patient empowerment health management model, employing a "hospital-community-home" dynamic tracking system to manage health records. It continually monitors patients' health status, elevating their enthusiasm for self-health management and enhancing their participation in managing their conditions, thereby having a positive impact on secondary prevention of stroke in patients. The incorporation of this patient empowerment approach includes five critical steps: assessing patients' needs during their hospital stay, setting rehabilitation goals, fully motivating patients' subjective initiative in managing their conditions, implementing information technology-based post-discharge management, and adjusting rehabilitation and treatment plans promptly. Collaboration among healthcare professionals, patients, and their families is established during the hospital stay, and patients are actively encouraged to manage their own health conditions post-discharge. The medical consortium model integrates healthcare resources from hospitals, communities, and households, allowing for seamless cooperation and synergy. Within this model, the patient empowerment health management approach offers comprehensive support and guidance to patients, ultimately leading to symptom improvement and better prognosis. Moreover, community healthcare workers enhance their knowledge of stroke prevention and management through the medical consortium model, reinforcing primary healthcare

cooperation and fostering real-time interactions among hospitals, communities, and households.

The effectiveness of this combined approach within the medical consortium model is evident. Firstly, the application of the medical consortium model significantly reduces the rehospitalization rates among stroke patients. This model's strength lies in uniting hospitals, communities, and family physicians into an alliance, facilitating the sharing of resources and information, resulting in comprehensive and continuous health management services. Patients under the medical consortium model receive more timely and effective medical interventions, effectively reducing the risk of rehospitalization. Secondly, the patient empowerment health management model significantly enhances the self-efficacy scores of stroke patients in the experimental group. The core of the patient empowerment health management approach is strengthening patients' self-management abilities. Through education, training, and support, it encourages patients to take an active role in their rehabilitation and prevention efforts. Patients in the experimental group, with the support of the medical consortium model, gain more confidence and competence in self-management, improving their self-efficacy and active participation in rehabilitation and prevention actions [23]. Further analysis reveals that the rate of improvement in patient empowerment nursing assessment scores is superior in the experimental group compared to the control group. This indicates that the patient empowerment health management approach effectively enhances the cognitive and practical aspects of nursing in the experimental group. Through patient empowerment health management within the medical consortium model, patients gain more nursing resources and information, acquire more knowledge about stroke, elevate their nursing self-efficacy, and consequently engage more effectively in self-management. Additionally, the experimental group exhibits higher scores in disease management motivation and medication adherence compared to the control group. The implementation of the patient empowerment health management model bolsters the disease management awareness and behavior of patients in the experimental group. Patients, guided by the medical consortium model, actively participate in disease management, leading to improved medication adherence, effectively stabilizing their condition, and reducing the risk of complications.

## 5. Conclusions

In summary, the fusion of the medical consortium model with the patient empowerment health management model presents an innovative approach to secondary stroke prevention. The medical consortium model provides the necessary resources and platform, while the patient empowerment health management model transforms these resources into patients' self-efficacy and health capabilities, making patients the focal point of healthcare management. With the support of the medical consortium model and the guidance of patient empowerment health management, stroke patients can take better control of their health destinies. They become active participants in their rehabilitation and

prevention, resulting in enhanced treatment outcomes and prognosis. Nevertheless, this study has limitations, such as a relatively short research period, constraints in resource allocation and management, which might impact the objectivity of the study results. Future research can extend the observation period and optimize the operation and resource allocation of the medical consortium model. This will facilitate an in-depth exploration of the long-term effects and sustainability of patient empowerment health management on stroke patients' prevention and rehabilitation.

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## Conflicts of Interest

The authors declare no conflicts of interest. The funders had no role in the design of the study; in the collection, analyses, or interpretation of data; in the writing of the manuscript, or in the decision to publish the results.

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