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Factors influencing self-care ability among stroke patients after discharge: a regression analysis of 1576 cases

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ABSTRACT

There are few reported studies on self-care ability among stroke patients. However, the recovery of self-care ability is crucial to patients' rehabilitation and quality of life. Therefore, this study aims to assess the current status of self-care ability among stroke patients at discharge and explore the factors influencing it, with the aim of providing a scientific basis for improving rehabilitation outcomes and quality of life for stroke patients in clinical practice. A total of 1576 stroke patients hospitalized at the affiliated hospital of Youjiang Medical University for Nationalities, China, from January 1 to June 30, 2023 were consecutively recruited via the convenience sampling method. Patients were divided into two groups according to their Barthel Index (discharge) score: the self-care group (≥60 points, 1227 cases) and the basically unable to take care of themselves (<60 points, 349 cases). General information and disease data questionnaires, the Barthel Index, the Johns Hopkins Fall Risk Assessment (JH-FRAT), the Kubota Water Swallow Test, and the Nutritional Risk Screening 2002 (NRS2002) were used to investigate and study these variables. Univariate analyses and multivariate logistic regression analyses were employed to identify factors influencing self-care ability at discharge. The study revealed that 349 stroke patients (22.1%) were moderately or severely dependent at discharge, requiring substantial assistance to perform daily living activities or being unable to complete most activities independently. Independent factors influencing self-care ability at discharge included the presence of lacunar infarction (p=0.001, OR=0.465, 95%

CI=0.295~0.734), a clear injury site (p<0.001, OR=0.010, 95% CI=0.004~0.026), limb paralysis (p<0.001, OR=0.148, 95% CI=0.064~0.334), the NRS2002 score (p<0.001, OR=2.688, 95% CI=1.787~4.043), and self-care ability at admission (p<0.001, OR=134.640, 95% CI=76.643~236.526). These findings highlight the need for personalized rehabilitation plans in clinical practice, incorporating early initiation of rehabilitation treatment to enhance functional recovery and improve the quality of life for stroke patients. Future research should focus on longitudinal studies and interventions targeting these factors to further optimize patient outcomes.

Keywords stroke patients, discharge, self-care ability, influencing factors

Stroke is one of the leading causes of long-term disability in adults worldwide. It has high incidence, mortality and disability rates and profoundly affects the health and quality of life of patients.[1] According to the World Stroke Organization (WSO), by 2022, stroke was the second leading cause of death worldwide and the third leading cause of death and disability.[2] In China, stroke is the leading cause of adult disability, and its incidence is on the rise with the aging of the population.[3] Stroke not only damages a patient's physical function but also has a negative effect on the patient's psychological and social functions, increasing the burden on the family and society.[4]

The self-care ability of stroke patients refers to the ability of patients to independently complete activities of daily living (ADL) after discharge, including basic activities such as eating, dressing, washing, going to the toilet, and moving. The recovery of self-care ability is crucial to patients' rehabilitation and quality of life.[5] For example, older patients with lower education levels usually face more challenges in regaining self-care ability, whereas patients with multiple chronic diseases (such as hypertension and diabetes) find it more difficult to regain self-care ability.[6]

In recent years, with the development of rehabilitation medicine, an increasing number of studies have focused on rehabilitation treatment and recovery of the self-care ability of stroke patients. Early rehabilitation intervention has been shown to significantly improve patients' self-care ability and quality of life.[7] In addition, family

and social support are considered important factors affecting the self-care ability of stroke patients. Good family support can provide emotional comfort and practical help, thereby promoting the recovery of patients.[8]

However, there are still deficiencies in the current research on the factors affecting the self-care ability of stroke patients at discharge, especially in different regions of China. This study aims to evaluate the current status of the self-care ability of stroke patients at discharge and explore the factors affecting it to provide a scientific basis for improving the rehabilitation effect and quality of life of patients in clinical practice.

Data and methods

Research subjects

This study adopted a cross-sectional survey design and was conducted at the affiliated hospital of Youjiang Medical University for Nationalities from January 1 to June 30, 2023. The participants were patients aged ⩾18 years who were diagnosed with stroke by a neurologist and were in the recovery or sequelae period. The inclusion criteria were as follows: (1) first or recurrent stroke; (2) hospitalization time ⩾3 days; and (3) ability to understand and cooperate with the research process. The exclusion criteria included the following: (1) language barriers, hearing impairments, or mental illness that affected participation in the survey; (2) other major diseases (such as malignant tumors, heart failure, or end-stage renal disease); and (3) inability to complete the questionnaire or assessment tool. All participants signed an informed consent form before discharge to ensure their right to know and participate.

This study received ethical approval from the Ethics Committee of Youjiang Medical University for Nationalities (Approval Number: 2023022801) in accordance with the Declaration of Helsinki. All participants provided informed consent and signed relevant agreements. The collected data have all been anonymized.

Sample size calculation

According to the empirical rule of at least 10 events per independent variable (EPV), considering that 22 independent variables are included in the model and referring to the Chinese Expert Consensus on Clinical Diagnosis and Treatment of Mild Stroke

(2024 Edition), 10% to 20% of stroke patients still have physical disabilities. The sample size calculation formula is as follows: 22 independent variables × 10 events/variables ÷ positive proportion. According to the minimum positive proportion of 10%, the minimum sample size required is 22×10÷0.1=2200; if the positive proportion is 20%, the minimum sample size is 22×10÷0.2=1100. To compensate for potential data loss (including 10% invalid questionnaires and questionnaire loss), we distributed 2000 questionnaires. Following the quality control procedures, 424 invalid responses were excluded, resulting in 1576 valid responses and an effective response rate of 78.80%.

Description of the patient screening process

In this study, 2000 patients were initially included, and 424 patients with missing basic information were excluded, leaving 1576 patients for the final data analysis, as detailed in the flow chart (Fig 1).

Research tools

General Information and Disease Data Questionnaires

The sociodemographic and disease characteristics of patients were collected through general information questionnaires and disease data questionnaires to understand the background and disease conditions of patients and provide basic data for subsequent analysis, including age, sex, ethnicity, marital status, occupation, education level, payment method, number of hospitalizations, length of hospital stay, and presence of hypertension, diabetes, lung infection, atherosclerosis, and organic heart disease.

Barthel Index

The Barthel Index can be used not only to assess a patient's self-care ability effectively but also to predict the patient's long-term rehabilitation effect and quality of life.[9] Therefore, in this study, the Barthel Index was used to assess patients' self-care ability. The scale contains 10 items with a total score ranging from 0--100 points. The higher the score is, the stronger the self-care ability. Specific items include eating, bathing, dressing, going to the toilet, moving, going up and down stairs, etc. ⩾60 points, basic self-care; 41–59 points, moderate functional impairment, needing

help in life; 21–40 points, severe functional impairment, obvious dependence in life; and ⩽20 points, complete dependence in life. The Barthel Index is a commonly used tool for assessing the self-care ability of stroke patients, with high reliability and validity.[10]

Johns Hopkins Fall Risk Assessment (JH-FRAT)

The Johns Hopkins Fall Risk Assessment (JH-FRAT) is used to assess a patient's fall risk. The scale divides patients into three levels—low risk, medium risk, and high risk—by evaluating the patient's balance ability, gait, use of assistive devices, etc. A score of less than 6 is considered low risk, a score between 6 and 13 is considered medium risk, and a score greater than 13 is considered high risk.[11] The JH-FRAT has high diagnostic accuracy and sensitivity [12] in assessing fall risk, which is highly important for the rehabilitation and safety management of stroke patients.

Kubota Water Swallow Test

The Kubota water swallow test is used to assess the patient's swallowing ability. Swallowing dysfunction is a common complication in stroke patients, affecting their eating and quality of life. The test divides the swallowing function into 1 to 5 levels by observing the patient's ability to swallow while drinking water. A level of 1 indicates normal, and a level of 5 indicates severe dysphagia. The water swallow test was a useful screening tool for aspiration among stroke patients and can provide clinicians with rapid screening results.[13] The test is fast and reliable methods for evaluating the dysphagia and risk of aspiration pneumonia without laborious and very few clinically applicable methods, such as endoscopic or video fluoroscopy, in patients who are hospitalized with stroke.[14]

Nutritional Risk Screening 2002 (NRS2002)

The NRS2002 is an effective nutritional risk screening tool for stroke patients. The NRS-2002 determines nutritional risk by evaluating BMI, weight change, dietary intake, and disease severity.[15] Malnutrition is associated with a variety of adverse prognoses in stroke patients, including increased infectious complications, delayed rehabilitation, and poor functional recovery.[16] Studies have shown that NRS2002 scores are closely related to patients' hospital stay, functional recovery, and

mortality.[17]

Data collection methods

After admission, the researchers introduced the significance, content and confidentiality principles of this study to the patients and conducted the investigation and research after providing informed consent. The general data of patients were obtained via case data and inquiry. The scale evaluation was completed independently by the subjects. For patients whose writing or expression was difficult, the researchers dictated the questionnaire to them and filled it out according to the patient's choice. The questionnaires were double-checked and confirmed by two researchers to ensure the objective accuracy of the questionnaire. Following questionnaire completion, two trained researchers independently reviewed each questionnaire for completeness on the spot, with immediate follow-up to resolve any missing or ambiguous responses. A total of 2000 questionnaires were distributed in this survey, with 424 invalid questionnaires excluded during quality control because they were incomplete or inconsistent, and 1576 cases ultimately recovered, for an effective recovery rate of 78.80%.

Statistical methods

SPSS 25.0 statistical software was used for data analysis. The data are expressed as frequencies and percentages, and the chi-square test was used for comparisons between groups. The subjects with a Barthel Index (discharge) score of $\geqslant$60 points were classified into the self-care group, and the subjects with a Barthel Index (discharge) score of <60 points were classified into the basically unable to take care of themselves group. When self-care ability was compared with age, sex, ethnicity, marital status, occupation, education level, payment method, number of hospitalizations, length of hospital stay, and presence of hypertension, diabetes, lung infection, atherosclerosis, or organic heart disease, the chi-square test was used for analysis and was used as the result of univariate analysis. A binary logistic regression model was established to perform multifactorial analysis on statistically significant variables (P<0.05) in the univariate analysis, and the differences were statistically

significant at $P<0.05$.

Results

Description of the general data of stroke patients

A total of 1576 stroke patients were included in this study, 349 (22.1%) of whom were moderately, severely, or completely dependent at discharge, required much help to complete daily living activities, or were unable to complete most activities independently. The sociodemographics, disease characteristics, and scores of each scale are shown in Table 1.

Univariate analysis of factors influencing self-care ability among stroke patients after discharge

The results of the univariate analysis revealed that multiple factors were associated with the self-care ability of stroke patients at discharge. The specific results are shown in Table 2. There were 14 significantly correlated factors, including education level, age, hospital stay, presence of lacunar infarction, presence of a clear injury site, limb paralysis, stroke type, Johns Hopkins fall risk assessment, Kubota drinking test score, nutritional risk screening NRS2002 score, self-care ability score at admission, presence of concurrent pulmonary infection, presence of concurrent atherosclerosis, and presence of concurrent organic heart disease.

Multivariate analysis of factors influencing self-care ability among stroke patients after discharge

Before conducting multivariate regression analysis, the researchers assigned values to the relevant variables, as shown in Table 3.

The results of multivariate logistic regression analysis revealed that the following factors were independent factors affecting the self-care ability of stroke patients at discharge (Table 4).

In terms of the presence of lacunar infarction, patients with lacunar infarction had poorer self-care ability at discharge (β=-0.765, SE=0.233, WaldX2=10.809, OR=0.465, 95% CI=0.295~0.734, p=0.001). In terms of the presence of a clear injury site,

patients with a clear injury site had significantly reduced self-care ability (β= -4.632, SE = 0.504, Waldx^2= 84.353, OR = 0.010, 95% CI = 0.004~0.026, $p < 0.001$). Limb paralysis: Limb paralysis had a significant negative effect on patients' self-care ability (β= -1.907, SE = 0.429, Waldx^2= 19.727, OR = 0.148, 95% CI = 0.064~0.344, $p < 0.001$). Nutritional risk screening NRS2002 score: A higher nutritional risk score was associated with poorer self-care ability (β= 0.989, SE = 0.208, Waldx^2 = 22.540, OR = 2.688, 95% CI = 1.787~4.043, $p < 0.001$). Self-care ability score at admission: Patients with higher self-care ability scores at admission also had better self-care ability at discharge (β= 4.903, SE = 0.287, Waldx^2 = 290.827, OR = 134.640, 95% CI = 76.643~236.526, $p < 0.001$).

Other variables, such as education level, age, length of hospital stay, stroke type, Johns Hopkins risk assessment score, Kubota water test score, presence of concurrent lung infection, presence of concurrent atherosclerosis, and presence of concurrent organic heart disease, although they were correlated in the univariate analysis, did not reach statistical significance in the multivariate analysis.

The results of the ROC analysis revealed that the sensitivity of the model was 0.922, the specificity was 0.957, the Youden index was 0.879, and the AUC was 0.965, indicating that the model had high predictive accuracy (Fig 2).

Discussion

This study used multivariate logistic regression analysis to explore the factors that affect the self-care ability of stroke patients at discharge. The results revealed that the presence of lacunar infarction, clear injury site, limb paralysis, nutritional risk screening NRS2002 score, and self-care ability score at admission were independent factors affecting the self-care ability of stroke patients at discharge. This provides an important reference for clinical practice, helping medical staff identify the potential risks of stroke patients early, predict them in advance, formulate targeted rehabilitation care plans, and improve patients' self-care ability and quality of life.

Lacunar infarction: The study revealed that patients with lacunar infarction had poor self-care ability at discharge (OR=0.465, 95% CI=0.295~0.734). Lacunar infarction is

usually associated with small vessel disease, which may lead to cognitive dysfunction and impaired motor function, thus affecting patients' self-care ability. This finding is consistent with previous research results, indicating that lacunar infarction has a significant negative effect on patients' daily living activities.[18] For example, RS Krawcyk et al. noted that patients with lacunar infarction have slower recovery of cognitive function and motor ability and need more rehabilitation support.[19] We believe that in most cases, lacunar infarction is a small vessel disease, with mild symptoms in the acute phase and a good prognosis. However, lacunar infarction is usually related to hypertension-related small vessel disease, and its pathological basis is chronic lesions of small vessels. Such lesions may lead to increased vascular fragility, thereby increasing the risk of subsequent large-area cerebral infarction or cerebral hemorrhage.[20,21] Therefore, lacunar infarction may indicate hidden dangers to cerebrovascular health, especially when patients have underlying diseases such as hypertension and diabetes. Clear site of injury: Whether there is a clear site of injury has a significant effect on patients' self-care ability (OR=0.010, 95% CI=0.004~0.026). In this study, this variable was derived on the basis of the results of computed tomography (CT) scans, that is, whether abnormal brain tissue was found in the patient's CT images. A clear site of injury may indicate more severe brain tissue damage, which in turn affects the patient's motor and cognitive functions. This finding emphasizes the importance of a detailed determination of the site of injury in clinical assessment. However, CT scans have limitations in detecting minor strokes or strokes located in the brainstem and posterior fossa. Studies have shown that patients who undergo CT scans may miss minor strokes because the scan's lack of sensitivity compared with those who do not undergo CT scans.[22] In contrast, computed tomography perfusion (CTP) is more effective in detecting minor strokes or strokes located in the brainstem and posterior fossa.[23] In addition, if the patient is examined a long time after the stroke, the original lesion may have been absorbed or repaired by the body, which may make the site of injury difficult to find. Limb paralysis: Limb paralysis is an important factor affecting the self-care ability of stroke patients (OR=0.148, 95% CI=0.064~0.334). Limb paralysis directly limits a patient's ability to

move and increases dependence on help from others. This finding is consistent with the results of multiple studies, indicating that limb paralysis is one of the main obstacles to the recovery of self-care ability in stroke patients.[24,25] For example, Mei et al. noted that the recovery of self-care ability in patients with limb paralysis requires more rehabilitation training and family support.[26,27] Nutritional risk screening NRS2002 score: Patients with higher nutritional risk scores had poorer self-care ability at discharge (OR=2.688, 95% CI=1.787~4.043). This finding is consistent with the results of Xiong, F.'s study, which revealed that patients with NRS-2002 scores ≥3 had a significantly increased risk of stroke-related infection (SAI) and that malnutrition was closely related to the recovery of patients' self-care ability.[28] Malnutrition may lead to decreased muscle strength and delayed wound healing, affecting the patient's recovery process. These findings suggest that nutritional support plays an important role in the rehabilitation of stroke patients. Kolanu, N. D. noted that individualized nutritional intervention helps maintain patients' weight and body fat during hospitalization. Therefore, regular assessment of dietary intake and nutritional status is essential for stroke patients at nutritional risk after discharge.[29] Kroc, Ł. One study reported that the NRS-2002 score was significantly correlated with patient age, body composition, daily living activities (ADL) and cognitive function (MMSE), indicating that the NRS-2002 score can not only effectively identify malnutrition risk but also predict the recovery of patients' self-care ability.[30] Self-care ability score at admission: Patients with higher self-care ability scores at admission also had better self-care ability at discharge (OR=134.640, 95% CI=76.643~236.526). These findings indicate that early self-care ability has an important effect on subsequent rehabilitation. For stroke patients with poor self-care ability upon admission, early intervention and rehabilitation training should be carried out as soon as possible, which is crucial for improving their self-care ability. For example, multiple studies have noted that early rehabilitation intervention can significantly improve patients' self-care ability and quality of life.[31,32]

strengths and weaknesses in relation to other studies

Compared with other studies, this research provides a comprehensive evaluation of multiple factors influencing self-care ability in stroke patients via a combination of clinical assessments and standardized tools. However, a cross-sectional design was adopted, and causality cannot be determined.[33] Future studies should consider the use of a longitudinal study design to better understand the changes in influencing factors over time and their impact on patient rehabilitation. The study sample was only from a hospital in Guangxi, which may limit the generalizability of the results. Future studies should expand the sample range to include hospitals in different regions to improve the representativeness of the research results. In addition, the sociodemographic data rely on patients' self-reports and may be subject to recall bias. [33]

Possible Explanations and Implications for Clinicians and Policy Makers

These findings suggest that early identification of risk factors such as lacunar infarction, limb paralysis, and nutritional risk can significantly impact rehabilitation outcomes for stroke patients. For clinicians, this highlights the importance of conducting thorough assessments at admission and tailoring rehabilitation plans to address these specific factors. Early intervention, particularly for patients with identified risk factors, can enhance functional recovery and improve quality of life. For policymakers, the results underscore the need for resource allocation toward comprehensive rehabilitation services and nutritional support programs in healthcare settings.

Future Research Directions

Future studies should further explore the interaction between these factors and conduct longitudinal studies and intervention studies to optimize rehabilitation management strategies for stroke patients. Understanding the complex interplay between various factors—such as initial self-care ability, nutritional status, and limb paralysis—and their combined impact on rehabilitation outcomes is crucial. Conducting longitudinal studies will allow researchers to track the progress of stroke

patients over extended periods, capturing changes in their condition and the effectiveness of different rehabilitation interventions. Intervention studies, particularly those involving novel techniques such as neurostimulation and assistive technologies, can help identify the most effective strategies for improving self-care ability and overall quality of life.

Conclusion

This study utilized multivariate logistic regression analysis to identify factors influencing the self-care ability of stroke patients at discharge. The findings revealed that the presence of lacunar infarction, a clear injury site, limb paralysis, higher nutritional risk screening (NRS2002) scores, and lower self-care ability scores at admission were significant predictors of poorer self-care ability at discharge. These results underscore the importance of early assessment and intervention in stroke rehabilitation, highlighting the need for personalized rehabilitation plans tailored to individual patient needs. Early initiation of targeted rehabilitation, particularly for patients with identified risk factors, is crucial for enhancing functional recovery and improving quality of life.

Data availability

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

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Author contributions statement

Writing manuscript: LJ, LH, and CL; Data extraction and statistical analysis: HZ, ML, TW, and RY; Project administration and supervision: LZ. All the authors reviewed the manuscript.

Additional information

The authors declare that they have no competing interests.

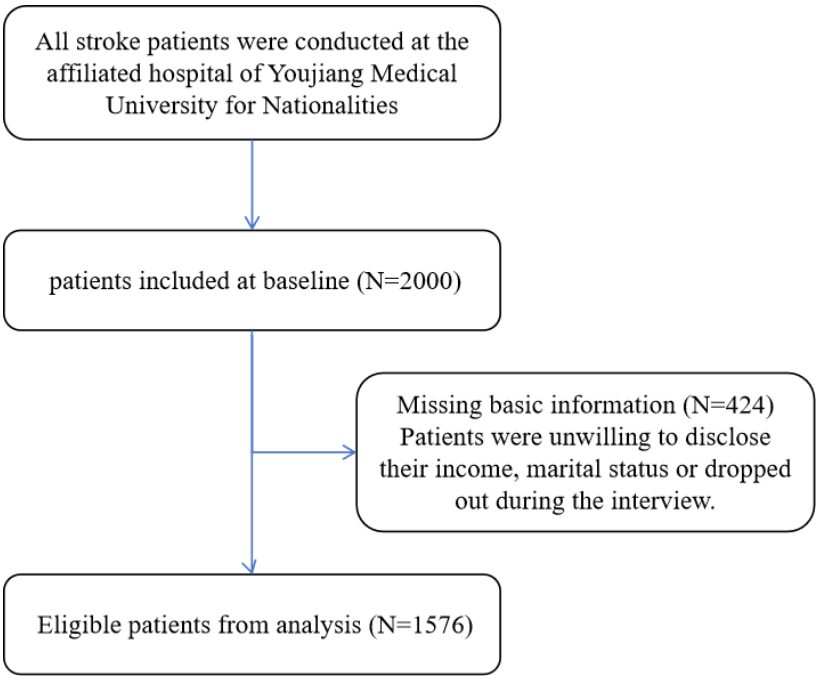


Fig 1. Description of the participant screening process.

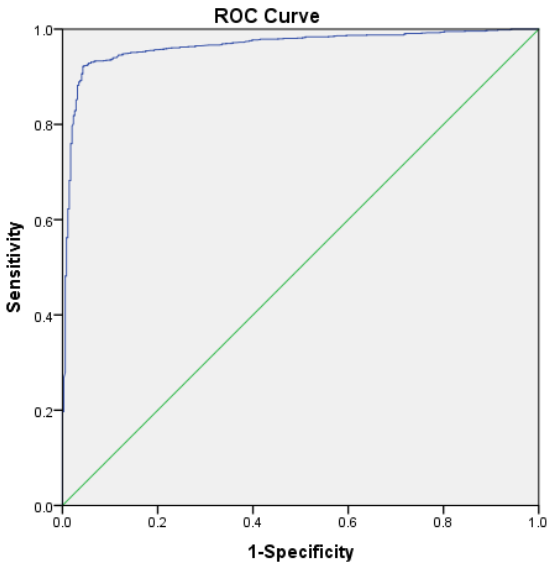


Fig 2. ROC Curve

Table 1 Descriptive statistics of the data of stroke patients (n=1576)

Variables	Categories	Frequency	%
Number of hospitalizations due to stroke	1 time	954	60.5
	2 times	340	21.6
	3 times	131	8.3
	4 times	151	9.6
Payment method	Basic medical insurance for urban employees	304	19.3
	Basic medical insurance for urban residents	181	11.5
	New rural cooperative medical insurance	832	52.8
	Self-paid	259	16.4
Gender	Male	501	31.8
	Female	1075	68.2
Nationality	Han	608	38.6
	Zhuang	906	57.5
	Other nationalities	62	3.9
Marital status	Unmarried	125	7.9
	Married	1451	92.1
Occupation	Farmer	778	49.4
	Employee or worker	122	7.7
	Self-employed or self-employed	618	39.2
	Unemployed	58	3.7
Education level	Illiterate	211	13.4
	Primary school	631	40.0
	Junior high school or technical secondary school	504	32.0
	Senior high school	162	10.3
	College and above	68	4.3
Age	15-35	17	1.1
	36-60	642	40.7
	61 and above	917	58.2
Number of days in hospital	3 days or less	212	13.5
	4-7 days	839	53.2
	8-14 days	468	29.7
	15 days and above	57	3.6
Is it lacunar infarction?	Yes	653	41.4
	No	923	58.6
Is there a clear site of injury?	Yes	1235	78.4
	No	341	21.6
Limb paralysis	No paralysis	1474	93.5
	Hemiplegia	102	6.5
Stroke type	Ischemic stroke	1505	95.5
	Hemorrhagic stroke	71	4.5
Johns Hopkins Falls and Falls Risk Assessment	Less than 6 points	730	46.3
	6-13 points	835	53.0
	More than 14 points	11	0.7
Kubota drinking	Level 1	1334	84.6

water test score			
	Level 2	197	12.5
	Level 3 and above	45	2.9
Nutritional risk screening NRS2002 score	3 points and above	411	26.1
	1-2 points	966	61.3
	0 points	199	12.6
Daily living activities score (admission)	0-59 points	506	32.1
	60-100 points	1070	67.9
Hypertension or not？	Hypertension	427	27.1
	Non-hypertension	1149	72.9
Is there any concurrent diabetes?	Yes	339	21.5
	No	1237	78.5
Is there any concurrent lung infection?	Yes	524	33.2
	No	1052	66.8
Is there any concurrent atherosclerosis?	Yes	273	17.3
	No	1303	82.7
Is there any concurrent organic heart disease?	Yes	268	17.0
	No	1308	83.0

Table 2 Univariate Analysis of Influencing Factors of Self-Care Ability Among Stroke Patients After Discharge

Variables	the basically unable to take care of themselves group	the basically self-care group	（%）	χ^2	*P*-value
Number of hospitalizations due to stroke					
1 time	197	757	20.6	3.516	0.319
2 times	80	260	23.5		
3 times	34	97	26		
4 times	38	113	25.1		
Payment method					
Basic medical insurance for urban employees	65	239	21.4	7.421	0.060
Basic medical insurance for urban residents	53	128	29.3		
New rural cooperative medical insurance	183	649	22		
Self-paid	48	211	18.5		
Gender					
Male	121	380	24.2	1.716	0.190
Female	228	847	21.2		
Nationality					
Han	121	487	19.9	4.043	0.132
Zhuang	210	696	23.2		
Other nationalities	18	44	29		
Marital status					
Unmarried	31	94	24.8	0.555	0.456
Married	318	1133	21.9		
Occupation					
Farmer	183	595	23.5	7.160	0.067
Employee or worker	18	104	14.8		
Self-employed or self-employed	140	478	22.7		
Unemployed	8	50	13.8		
Education level					
Illiterate	73	138	34.6	26.168	＜0.001
Primary school	140	491	22.2		
Junior high school or technical secondary school	100	404	19.8		
Senior high school	25	137	15.4		

College and above	11	57	16.2		
Age					
15-35	2	15	11.8	23.81	＜0.001
36-60	105	537	16.4		
61 and above	242	675	26.4		
Number of days in hospital					
3 days or less	31	181	14.6	52.246	＜0.001
4-7 days	148	691	17.6		
8-14 days	146	322	31.2		
15 days and above	24	33	42.1		
Is it lacunar infarction?					
Yes	221	432	33.8	88.515	＜0.001
No	128	795	13.9		
Is there a clear site of injury?					
Yes	343	892	27.8	104.885	＜0.001
No	6	335	1.8		
Limb paralysis					
No paralysis	277	1197	18.8	148.448	＜0.001
Hemiplegia	72	30	70.6		
Stroke type					
Ischemic stroke	325	1180	21.6	5.861	0.015
Hemorrhagic stroke	24	47	33.8		
Johns Hopkins Falls and Falls Risk Assessment					
Less than 6 points	73	657	10	127.957	＜0.001
6-13 points	269	566	32.2		
More than 14 points	7	4	63.6		
Kubota drinking water test score					
Level 1	254	1080	19	65.466	＜0.001
Level 2	67	130	34		
Level 3 and above	28	17	62.2		
Nutritional risk screening NRS2002 score					
3 points and above	143	268	34.8	61.978	＜0.001
1-2 points	188	778	19.5		
0 points	18	181	9		
Daily living activities score (admission)					
0-59 points	329	177	65	794.649	＜0.001
60-100 points	20	1050	1.9		
Hypertension or not？					

Hypertension	90	337	21.1	0.387	0.534
Non-hypertension	259	890	22.5		
Is there any concurrent diabetes?					
Yes	71	268	20.9	0.361	0.548
No	278	959	22.5		
Is there any concurrent lung infection?					
Yes	172	352	32.8	51.932	＜0.001
No	177	875	16.8		
Is there any concurrent atherosclerosis?					
Yes	83	190	30.4	13.062	＜0.001
No	266	1037	20.4		
Is there any concurrent organic heart disease?					
Yes	84	184	31.3	15.848	＜0.001
No	265	1043	20.3		

Table 3 Variable Assignment Description Table

Variables	Assignment
Education level	Illiterate=0, Primary school=1, Junior high school or technical secondary school=2, Senior high school=3, College and above=4
Age	15-35=0, 36-60=1, 61 and above=2
Number of days in hospital	3 days or less=0, 4-7 days=1, 8-14 days=2, 15 days and above=3
Is it lacunar infarction?	Yes=0, No=1
Is there a clear site of injury?	Yes=0, No=1
Limb paralysis	No paralysis=0, Hemiplegia=1
Stroke type	Ischemic stroke=0, Hemorrhagic stroke=1
Johns Hopkins Falls and Falls Risk Assessment	Less than 6 points=0, 6-13 points=1, More than 14 points=2
Kubota drinking water test score	Level 1=0, Level 2=1, Level 3 and above=2
Nutritional risk screening NRS2002 score	3 points and above=0, 1-2 points=1, 0 points=2
Daily living activities score	0-59 points=0, 60-100 points=1
Is there any concurrent lung infection?	Yes=0, No=1
Is there any concurrent atherosclerosis?	Yes=0, No=1
Is there any concurrent organic heart disease?	Yes=0, No=1

Table 4 Multivariate Analysis of Influencing Factors of Self-Care Ability Among Stroke Patients After Discharge

Variables	β	SE	Wald	OR	95% CI	*P*-value
Education level	0.022	0.116	0.037	1.023	0.814, 1.285	0.847
Age	0.363	0.258	1.978	1.438	0.867, 2.385	0.160
Number of days in hospital	0.002	0.152	0	1.002	0.744, 1.35	0.988
Is it lacunar infarction?	-0.765	0.233	10.809	0.465	0.295, 0.734	0.001
Is there a clear site of injury?	-4.632	0.504	84.353	0.010	0.004, 0.026	＜0.001
Limb paralysis	-1.907	0.429	19.727	0.148	0.064, 0.344	＜0.001
Stroke type	-0.61	0.514	1.41	0.543	0.198, 1.487	0.235
Johns Hopkins Falls and Falls Risk Assessment	-0.397	0.263	2.28	0.672	0.401, 1.126	0.131
Kubota drinking water test score	0.271	0.206	1.727	1.311	0.876, 1.962	0.189
Nutritional risk screening NRS2002 score	0.989	0.208	22.54	2.688	1.787, 4.043	＜0.001
Daily living activities score (admission)	4.903	0.287	290.827	134.64	76.643, 236.526	＜0.001
Is there any concurrent lung infection?	-0.406	0.233	3.028	0.667	0.422, 1.053	0.082
Is there any concurrent atherosclerosis?	-0.459	0.288	2.533	0.632	0.359, 1.112	0.112
Is there any concurrent organic heart disease?	-0.368	0.298	1.529	0.692	0.386, 1.24	0.216
Constant	3.085	0.741	17.332	21.862		＜0.001

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