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Original Article

Effect of "Internet + tertiary hospital-primary hospital-family linkage home care" model on self-care ability and quality of life of discharged stroke patients

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Abstract: Objective: To investigate the intervention effect of an "Internet + tertiary hospital-primary hospital-family linkage home care" model on the quality of life and self-care abilities of discharged stroke patients. Methods: The clinical data of 90 patients with stroke who were hospitalized and discharged from the Department of Neurology of the Affiliated Hospital of Youjiang Medical College for Nationalities from October 2020 to September 2021 were retrospectively analyzed. They were split into a control group (41 cases) and an intervention group (40 cases) based on different care modes. The intervention group was given the "Internet + tertiary hospital-primary hospital-family connection home care" paradigm, while the control group received normal nursing interventions. The degree of nerve defect, quality of life, anxiety and depression, self-care ability and exercise ability of the patients were evaluated by National Institutes of Health Stroke Scale (NIHSS), Stroke Specific Quality of Life Scale (SS-QOL), General Hospital Anxiety and Depression Scale (HADS), Self-care Ability Scale (ESCA), and Fugl-Meyer Motor Function Assessment (FMA) before discharge and at 3rd, 6th and 12th month after discharge, respectively. The re-hospitalization rate, treatment compliance and exercise ability of the two groups were compared within a year after discharge. Results: The scores of SS-QOL, ESCA and FMA in the intervention group increased with time, and the scores of SS-QOL, ESCA and FMA at 3rd, 6th and 12th month after discharge were higher than those in the control group (all $P<0.05$). The NIHSS and HADS scores decreased over time, and the NIHSS and HADS scores were lower than the control group at 12th month after discharge ($P<0.05$). Within a year of discharge, the intervention group had a lower rehospitalization rate than the control group ($P<0.05$), and the treatment compliance score was higher in the intervention group than that in the control group ($P<0.05$). Conclusion: The "Internet + tertiary hospital-primary hospital-family nursing" model can improve self-care ability and treatment compliance of patients, improve their nerve defects and psychological status as well as quality of life, and reduce rehospitalization rate.

Keywords: Stroke, internet, hospital-community-family, quality of life, self-care

Introduction

Stroke is a common acute cerebrovascular disease and may cause high morbidity, mortality, and disability. The fatality rate of stroke has been on the decline in recent years due to advancements in medical technology, but its incidence has been rising annually. The recurrence rate within a year of onset is 5.48% [1], and the acute disability rate is as high as 40-60% [2]. The main manifestations of stroke include physical dysfunction, sensory retardation, language disorders and consciousness disorders [3]. Disability not only reduces the patient's social participation but also produces negative psychology such as depression and autism due to difficulty in accepting the disability and unwillingness to face the reality, which severely affects their disease prognosis and quality of life. Study [4] has pointed out that ear-

lier rehabilitation training and outside-the-hospital rehabilitation are beneficial for limb and neural tissue recovery, decrease in the disability rate, and improvement in quality of life. Study has shown that more than 80% of stroke patients with dysfunction returned to their families directly after discharge with most rehabilitation taking place in the community and at home, requiring nearly 44 million full-time staff for daily care [5]. However, the care ability of the community and family caregivers is limited, and there is a general lack of effective decision-making and care assistance. As a result, patients have to discontinue professional rehabilitation after discharge from the hospital and miss the best time for recovery, which places a greater psychological burden on patients. In China, at present, the continuous nursing provided for discharged patients is mainly through telephone follow-up, WeChat, and family visits. Due to the limitations of manpower and material resources, long-term and effective guidance cannot be provided to patients [6]. Hospital-community-family continuous nursing refers to the continuous treatment, nursing and rehabilitation provided by hospitals, community medical institutions, families and other forces with the passage of time and the change of location. In addition to enabling patients to resume their normal lives following discharge and greatly enhancing their capacity to function, it can also significantly mitigates neurological impairments, anxiety, and depressive symptoms [7]. At present, the extended care model is only carried out in economically developed areas, but with the rapid development of Internet technology, the model can develop in remote areas. This nursing model breaks the limitations of the traditional nursing model in distance and space and ensures the continuity of home nursing. In this study, we used the 'Internet + nursing service' network platform to provide tertiary hospital-primary hospital-family linkage home care for stroke-discharged patients in the Baise area and explored its impact on the quality of life, negative psychology, self-care and re-hospitalization rate of discharged stroke patients.

Materials and methods

General information

The clinical data of 90 patients with stroke who were hospitalized and discharged from the Department of Neurology of the Affiliated Hospital of Youjiang Medical College for Nationalities from October 2020 to September 2021 were retrospectively analyzed. Inclusion criteria: ① age ≥18 years old, first onset, meeting the diagnostic standards of stroke disease [8], and confirmed by head CT or MRI; ② the first hospitalization, received the same treatment, in the recovery period; ③ typical limb motor dysfunction caused by stroke; ④ with consciousness that can understand and accept rehabilitation guidance. Exclusion criteria: ① patients with heart, lung, kidney and other organ failure; ② with psychological, amentia or end-stage disease; ③ patients who could not take care of themselves in daily life before stroke.

The patients were divided into a control group (45 cases) and an intervention group (45 cases). In the control group, 1 case died outside the hospital due to accident, 1 case was transferred to another city for treatment, 2 cases withdrew halfway, and finally 41 cases completed the follow-up. In the intervention group, 4 cases dropped out of the study, 1 case died due to cerebral hemorrhage, and 40 cases completed the intervention. This study was approved by the Ethics Committee of Affiliated Hospital of Youjiang Medical College for Nationalities.

Research methods

Control group: The control group underwent routine nursing for 12 months. During hospitalization, the responsible nurses carried out health education and early rehabilitation guidance for the enrolled patients and established a WeChat group. At the time of discharge, routine discharge guidance was given, including the main items and precautions of home-based self-rehabilitation exercise, as well as medication, diet, rest and outpatient follow-up after discharge. Routine telephone follow-up at 1st, 3rd, 6th and 12th month after discharge. At each follow-up, the recovery of stroke patients was investigated, the health problems of the patient were addressed, the guidance and answers were provided to patients and their family members, and the patients were urged to adhere to home-based self-rehabilitation training, take medicine on time and return for follow-up visit. The main contents of each telephone follow-up were registered in the hospital

patient discharge follow-up system, and the data were collected by the Questionnaire Star after the telephone follow-up at the 3rd, 6th and 12th month. For patients who failed to complete the Questionnaire Star, a home visits was conducted in the next day after the telephone follow-up to collect relevant data.

Intervention group: The intervention group was given "Internet + tertiary hospital-primary hospital-home linkage home care" intervention based on conventional care.

(1) Establishment of a 'tertiary hospital-primary hospital-community linkage home care' team, consisting of a supervision group, a rehabilitation guidance group and a home care group. The supervision group was composed of 3 nurses from the nursing department and 3 full-time nurses from the 'Internet + nursing service' office. The nursing department was mainly responsible for guiding the research project. The full-time nurses mainly trained the home care group and home visit training, established health records and management for discharged stroke patients, and formulated relevant systems and processes for home care. The rehabilitation group was composed of a rehabilitation nurse, a nutritionist, a psychological consultant, a doctor and two stroke specialist nurses. The rehabilitation group mainly completed the discharge risk assessment and home care needs assessment, developed the patient discharge rehabilitation plan, and transmitted the patient-related data to the 'Internet + nursing service' office. The home care group was composed of online nurses from tertiary hospitals and primary hospitals, mainly responsible for home visits.

(2) Establishment of 'Internet + Nursing Service' network platform. With the help of the 'Smart Hospital' information platform, a network-based nursing platform was built. The platform has three ports: management port, medical port and patient port. The medical port and the patient port can be connected to the smartphone through the WeChat. Management port: the port was maintained and managed by a full-time staff of the 'Internet + Nursing Service' office. The port mainly includes order transaction management, operation management, project maintenance, employee management and positioning tracking, patient management, medical record data collection and storage, service personnel positioning, information security protection, service behavior throughout the traces, workload statistical analysis and other functions. During the implementation of on-site nursing, full-time staff tracked the whole process of service personnel, ensured the safety of both patients and sorted out and saved the relevant data of each on-site nursing. Medical port: medical staff could enter the home care network through the port to achieve patient referral, knowledge and technology transfer and exchange, patient treatment and nursing discussion, as well as nurse training. The online training of nurses in primary hospitals was homogenized by tertiary hospitals, and the training content was made into PPT courseware, and the video was recorded and uploaded to the platform for nurses to learn. When patients apply for home nursing service online, they will be visited by a nurse assigned by the professional staff of the "Internet + Nursing Service" office. Patient port: the port can meet the individual needs of patients by fulfilling the functions of learning home care techniques, making appointments for home service, selecting home service nurses, and evaluating orders. Through this platform, a tertiary hospital-primary hospital-family contact network was established to facilitate medical staff to get the rehabilitation condition of patients after discharge. Studies have shown that the three-in-one intervention model assisted by Internet technology, with specialist nurses as the hub, community rehabilitation as the support, and family as the leading factor, can provide standardized, information-based and efficient post-discharge nursing services for patients.

(3) Formulation of discharge rehabilitation nursing plan. The neurological specialist nurses used a self-made discharge assessment form to evaluate the patients before discharge. The form includes four aspects: nursing grading (vital signs, disease grade, self-care ability, nursing grade, disease outcome), basic nursing (pain, nutrition, diet, skin, expectoration, stool, urination, psychology, sleep, social support), specialist examination (consciousness, cognitive function, motor muscle strength, swallowing function, sensory function, language), risk management (fall risk, pressure ulcer risk, pipeline slippage risk, nutritional risk) and disease cognition and specialist rehabilitation. At the same time, the self-administered Home

Care Needs Questionnaire survey was applied to assess the home care needs of patients after discharge. The evaluation results and patient-related data were transmitted to the 'Internet + Nursing Service' office. According to the patient's condition, the full-time staff jointly developed a personalized discharge rehabilitation plan, including stroke specialist rehabilitation project formulation, home diet, home medication, activity guidance, pressure ulcer prevention, anti-pipeline slippage, follow-up and home visits. Based on the patient's physical condition, the discharge plan sheet and patients' condition were uploaded to the online nursing platform in conjunction with the rehabilitation department, nutrition division, psychological counselor, competent doctor, competent nurse and specialist nurses and patients and their families. During hospitalization, the nurse in charge carried out disease rehabilitation health education for the patients and guided the patients and their families to use the online nursing platform. On the day of discharge, the full-time staff went to the bedside again to inform the patients and their families of the post-discharge rehabilitation nursing plan and determine whether they would place orders on the online nursing platform and receive feedback from the medical staff and initially collected relevant data.

(4) Implementation foundation of "Internet + tertiary hospital-primary hospital-family linkage home care". According to the personalized rehabilitation nursing plan for patients discharged from the hospital, the full-time staff and specialist nurses of the 'Internet + Nursing Service' office will go to the patients' home after discharge. The first 3 months after discharge were the intensive period, with home care once a month. The maintenance period was 3 to 6 months after discharge, during which home care was given 1 to 2 times. The follow-up period was 7-12 months after discharge, during which home care was given once. The frequency of home care can be changed according to the actual rehabilitation of patients. After discharge, the rehabilitation lasted for 1 year, during which the patients and their families placed online orders to apply for home care services and full-time staff of the 'Internet + Nursing Service' office arranged nurses from tertiary hospitals or primary hospitals to their door. In addition to online orders, the office staff also provided rehabilitation nursing guidance to patients, including health education on stroke-related knowledge, healthy diet, standardized medication, blood pressure control, self-monitoring, outpatient follow-up, rehabilitation exercise, *etc*. During the follow-up visit, the relevant core knowledge was explained and recorded, and the implementation was checked at the next follow-up to guide the rehabilitation of next step. During home visits, relevant data were collected again by full-time staff at the 3rd, 6th, and 12th month.

Observation indicators

(1) The National Institutes of Health Stroke Scale (NIHSS) was used to assess the degree of nerve defect of the stroke, with a total score of 42. The lower the score, the better the state of the patient.

(2) SS-QOL: The SS-QOL scale was translated and revised by Chinese scholar Li Juntao et al [9]. The scale includes 12 dimensions, namely energy, family role, language, activity, emotion, personality, self-care ability, social role, thinking, upper limb function, vision, and work/labor, for a total of 49 items. Each entry was evaluated using a Likert 5-point scale, with the full score of 245 points. A higher score indicates a better quality of life for the patient. The scale's Cronbach's α was above 0.76. The Kappa coefficient was between 0.816 and 1.00.

(3) Exercise of Self-care Agency (ESCA) scale: The Chinese version of ESCA was translated by Chinese Taiwan scholar Hsiu-Hung Wang [10]. The scale includes 43 items, 11 of which are reversely scored, covering four dimensions of self-concept, self-care responsibility, self-care skills, and level of health knowledge. For each item, there are five options: "very unlike" - 0, "somewhat unlike" - 1, "not sure" - 2, "somewhat like" - 3, and "very like" - 4. The overall score is 172, with higher scores indicating better self-care skills. Cronbach's α of all dimensions is 0.86-0.92, and the content validity is 1.0.

(4) The General Hospital Anxiety and Depression Scale (HADS) was applied to assess the level of anxiety and depression of the patients. It includes 14 items in two subscales, including 7 items in the anxiety dimension and 7 items in the depression dimension. The total score of each subscale was calculated using a Likert 4-level scoring system with a range from 0 to

Table 1. Comparison of basic data between the two groups of patients

Item		Intervention group (n=40)	Control group (n=41)	t/x^2 value	*P* value
Age (yrs)		59.38±9.21	58.12±16.54	0.569	0.571
Gender	Male	26	28	0.164	0.685
	Female	14	13		
Marital status	Spouse present	36	35	0.356	0.550
	No spouse	4	6		
Standard of culture	Junior high school and below	24	27	0.298	0.585
	High school and above	16	14		
Occupation	Have a job	31	30	0.204	0.651
	Jobless	9	11		
Stroke type	Cerebral arterial thrombosis	18	23	0.998	0.318
	Hemorrhagic stroke	22	18		
Inhabiting information	Living with family	35	33	0.739	0.390
	Live alone	5	8		

21. A score of 0-7 indicates no symptoms, 8-10 indicates suspicion, and 11-21 indicates a certain presence.

(5) Rehospitalization rate. After 12 months of intervention, the rehospitalization of patients was obtained through on-site visits, telephone calls, WeChat and medical record information inquiries, and the number of patients who were re-hospitalized (1 time or more) due to stroke and its complications was counted. The readmission rate = [(readmission cases)/total cases × 100%].

(6) Treatment compliance: A self-made questionnaire with a total score of 100 was distributed out through the Questionnaire Star. The main items included compliance with standardized medication, a reasonable diet, rehabilitation training, etc. A higher score indicates higher patient compliance.

(7) Motor function: Fugl-Meyer motor function assessment (FMA) [11], was used to assess the motor function of patients. There are a total of 66 points subjected to upper limb function evaluation, and 4 points subjected to the lower limb. A higher score indicates better motor function.

Statistical analysis

The SPSS 23.0 software was applied for data analysis and processing. Quantitative data that conformed to a normal distribution were expressed as ($\bar{x}$±s), and t-test was used for comparison between the groups. Count data were expressed as n (%), and the chi-square test was used for comparisons between two groups. Data at different time points between groups were compared by repeated measures ANOVA. *P*<0.05 was considered statistically significant.

Results

Comparison of general data between the two groups

There was no significant difference in age, gender, education level and other general information between the two groups (all *P*>0.05) (**Table 1**).

Comparison of NIHSS scores between the two groups

As shown in **Figure 1**, before nursing, there was no significant difference in NIHSS score between the two groups (*P*>0.05). After nursing, the NIHSS score of both groups decreased. There was no significant difference in NIHSS score between the two groups at 3rd and 6th month of nursing (both *P*>0.05). After 12 months of nursing, the NIHSS score of the intervention group was statistically lower than that of the control group (P<0.05).

Comparison of the SS-QOL scores between the two groups

Before nursing, there was no significant difference in SS-QOL scores between the two groups (P>0.05). The energy, family role, emotion, per-

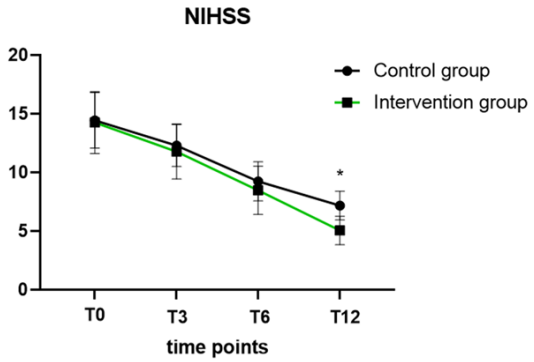


Figure 1. Comparison of NIHSS scores between the two groups. Notes: T0: before discharge; T3: 3 months after discharge; T6: 6 months after discharge; T12: 12 months after discharge; *, $P<0.05$.

sonality, social role, thinking, upper limb function and total score of the two groups after nursing were improved compared with those before nursing. After 3 months of nursing, there was no significant difference in SS-QOL scores between the intervention group and the control group (P>0.05). After 6 months and 12 months of nursing, the SS-QOL score of the intervention group was statistically higher than that of the control group (P<0.05) (**Figure 2**).

Comparison of the HADS scores between the two groups

Before nursing, there was no significant difference in HADS and its sub-items between the two groups (all $P>0.05$). After nursing, HADS scores were significantly reduced in both groups. There was no significant difference in HADS scores between the two groups after 3 months of nursing ($P>0.05$). After 6 months and 12 months of nursing, the HADS score of the intervention group was significantly lower than that of the control group (both $P<0.05$) (**Figure 3**).

Comparison of the ESCA scores between the two groups

Before discharge, there were no significant differences in the four dimensions of ESCA scores between the two groups (all $P>0.05$). After 3, 6 and 12 months of discharge, the total ESCA score of the intervention group was higher than that of the control group, and the difference was statistically significant (intergroup effect: F=10.22, $P<0.05$). The ESCA score of both groups showed a trend of increasing over time (time effect: F=101.78, $P<0.001$), and there was an interaction effect between groups and time (interaction effect: F=17.83, $P<0.001$) (**Table 2**).

Comparison of rehospitalization rate between the two groups

There were 8 cases of re-hospitalizations in the intervention group and 16 in the control group including 4 cases that were re-admitted twice. The rate of re-hospitalization was significantly lower in the intervention group than that in the control group ($P<0.05$) (**Table 3**).

Comparison of treatment compliance scores between the two groups of patients

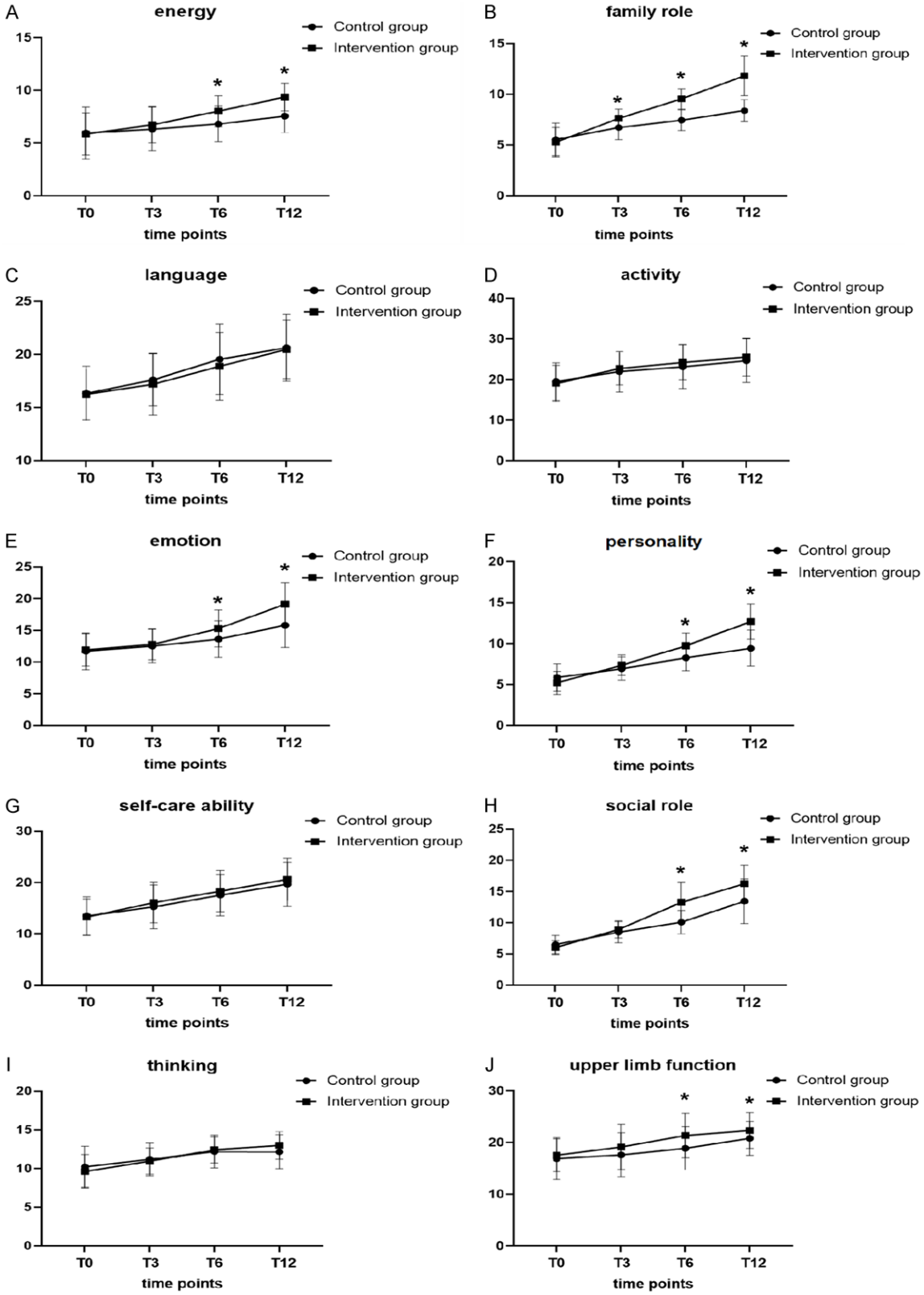
The scores of standardized drug use, rehabilitation training and reasonable diet in the intervention group were higher than those in the control group (all $P<0.05$) (**Figure 4**).

Comparison of the FMA scores between the two groups

Between the control group and the intervention group, there was no discernible change in FMA before discharge ($P>0.05$). After discharge, the motor function of the two groups was improved, and after 3 months, 6 months, 12 months, the improvement in the intervention group was significantly better than that of the control group (all $P<0.05$) (**Figure 5**).

Discussion

The ultimate goal of stroke rehabilitation is to enhance patients' quality of life and assist them in reintegrating to society and their families. Related articles show that the quality of life of stroke patients is significantly lower than that of ordinary healthy people matched by gender and age due to the long-term physical, psychological and social adverse effects caused by the disease [12]. At the same time, the quality of life continues to decline with the progress of the disease, thus affecting the recovery of patients [13]. At 6 and 12 months after discharge, the intervention group outperformed the control group in all six elements and total SS-QOL scores for energy, family role, emotion, personality, social role, and upper limb function. It demonstrates that the use of "Internet + tertiary hospital-primary hospital-family linkage


A
energy
Control group
Intervention group
time points
B
family role
C
language
D
activity
E
emotion
F
personality
G
self-care ability
H
social role
I
thinking
J
upper limb function
T0
T3
T6
T12

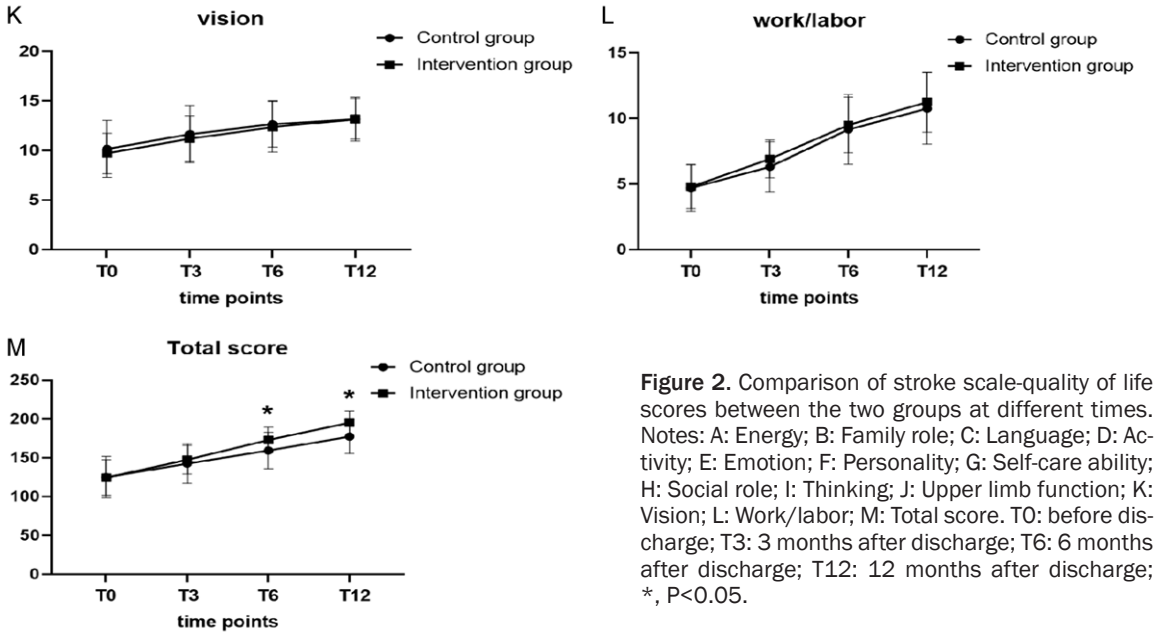


Figure 2. Comparison of stroke scale-quality of life scores between the two groups at different times. Notes: A: Energy; B: Family role; C: Language; D: Activity; E: Emotion; F: Personality; G: Self-care ability; H: Social role; I: Thinking; J: Upper limb function; K: Vision; L: Work/labor; M: Total score. T0: before discharge; T3: 3 months after discharge; T6: 6 months after discharge; T12: 12 months after discharge; *, P<0.05.

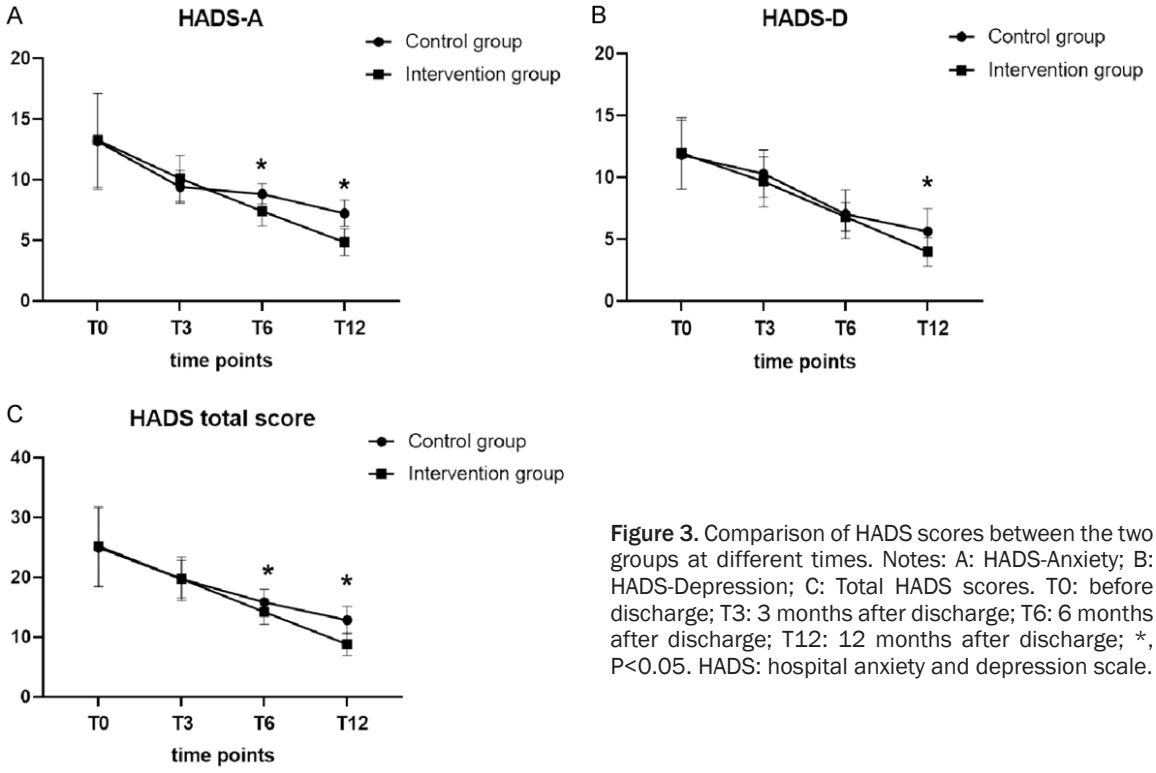


Figure 3. Comparison of HADS scores between the two groups at different times. Notes: A: HADS-Anxiety; B: HADS-Depression; C: Total HADS scores. T0: before discharge; T3: 3 months after discharge; T6: 6 months after discharge; T12: 12 months after discharge; *, P<0.05. HADS: hospital anxiety and depression scale.

home care" model can enhance patients' quality of life after discharge, and the improvement gets better with time. This is consistent with the results of Wang Juans' study [14].

Study also indicates a relationship between stroke patients' self-care ability and their quality of life [15]. The improvement in self-care capacity can lighten the load on caregivers, boost patients' enthusiasm for rehabilitation therapy, and assist them in getting back to a regular life [16]. The results in this study indicate that patients in the observation group had higher ESCA scores than the control group at 3,

Table 2. Comparison of the exercise of self-care agency scores between the two groups at different times

Item	Group	Before discharge	Discharge for 3 months	Discharge for 6 months	Discharged 12	F_{time} (P)	$F_{grouping}$ (P)	$F_{reciprocation}$ (P)
Self-concept	Intervention group	16.50±3.59	19.50±4.09	21.18±4.94	23.93±4.24	46.54 (P<0.001)	10.22 (P=0.002)	13.61 (P<0.001)
	Control group	16.15±3.12	17.83±4.02	18.07±4.02	18.54±4.35			
Self-care responsibility	Intervention group	11.80±2.81	13.98±2.58	15.45±1.15	17.37±2.37	53.26 (P<0.001)	4.33 (P=0.006)	5.97 (P=0.001)
	Control group	11.90±2.62	12.97±2.84	13.51±1.97	14.68±2.73			
Self-nursing skill	Intervention group	17.40±3.61	19.75±3.65	23.30±4.46	25.30±6.39	50.72 (P<0.001)	5.69 (P=0.019)	9.84 (P<0.001)
	Control group	17.70±4.33	18.78±4.68	19.90±4.42	21.07±4.54			
Health knowledge level	Intervention group	25.45±4.19	28.25±4.44	31.28±6.39	33.88±7.25	28.65 (P<0.001)	5.79 (P=0.018)	5.16 (P=0.003)
	Control group	25.27±4.39	26.15±5.31	27.87±5.87	28.90±6.57			
Aggregate score	Intervention group	71.15±13.06	82.03±12.29	91.20±13.15	100.48±13.56	101.78 (P<0.001)	10.22 (P=0.002)	17.83 (P<0.001)
	Control group	71.19±14.08	75.73±14.12	79.37±13.08	83.19±13.69			

Note: ESCA: Exercise of Self-care Agency.

Table 3. Comparison of rehospitalization between the two groups

Group	Number of samples	Hospitalized again	Rehospitalization 2 times	Rehospitalization rate
Control group	41	12 (29.3)	4 (9.8)	16 (39.0)
Intervention group	40	8 (20)	0 (0)	8 (10.3)
χ^2				4.076
P				0.043

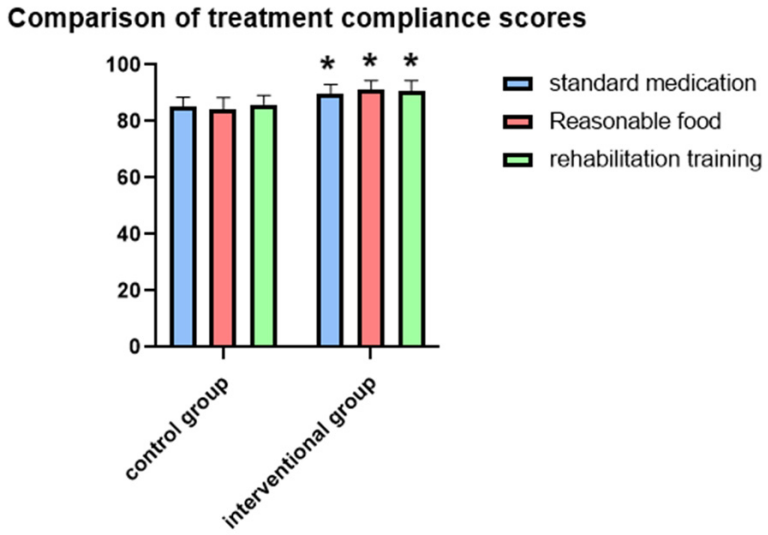


Figure 4. Comparison of treatment compliance scores between the two groups of patients. Note: *, P<0.05.

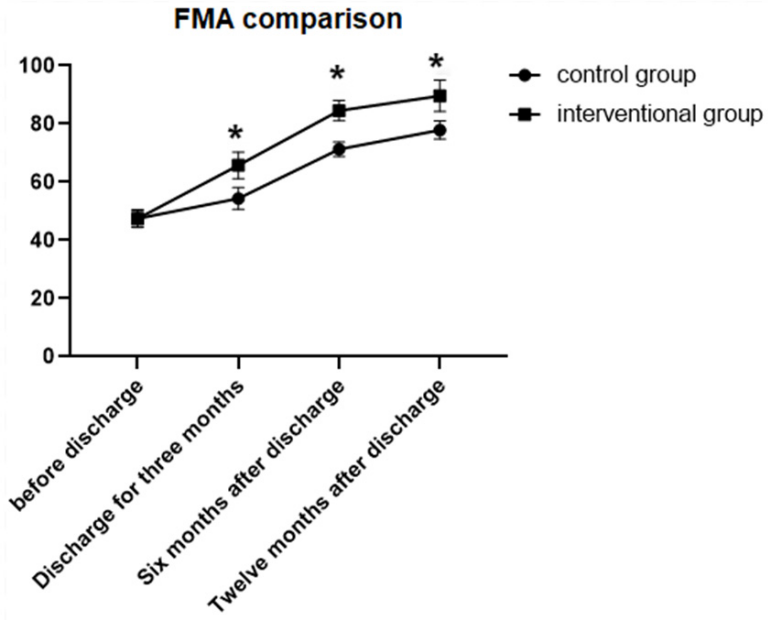


Figure 5. Comparison of FMA scores between the two groups at different times. Note: *, P<0.05. FMA: Fugl-Meyer motor function assessment.

6 and 12 months after discharge, and the between-group effect, time effect, and interaction were statistically significant, suggesting that the implementation of this nursing model can improve patients' self-care ability, which is consistent with Chamenpei's results [17]. It may be due to the fact that the rehabilitation plans after discharge was made according to individual's conditions and needs as advocated by the nursing mode. During the intervention process, the full-time staff dynamically evaluated, fed back and coordinated patients' rehabilitation work relying on the network platform, and the patients and their families could obtain nursing services at any time through the platform according to their own needs, realizing refined, dynamic and individualized rehabilitation plan to meet the needs of patients.

Psychological disorders may interfere with the recovery of stroke patients, and are closely related to higher recurrence rates, disease severity, cognitive impairment and mortality [18]. Relevant guidelines have pointed out that early intervention of stroke patients with psychological distress can effectively improve rehabilitation outcomes such as long-term disability and disease incidence [19]. Study [20] has shown that the incidence of post-stroke depression is as high as 79%, which is the most common psychological

change in those who are sick. In this study, the two groups of patients suffered different levels of anxiety and sadness before discharge. At 6 and 12 months after discharge, patients in the observation group had lower anxiety, depression and total scores than those in the control group. These results indicate that the implementation of "Internet + tertiary hospital-primary hospital-family linkage home care" mode can effectively reduce patients' negative emotions, and the improvement increases over time. The reason may be that the patients and their families in this nursing model can carry out personalized nursing services at any time through the online platform to improve the quality of care, thus reducing the negative emotions of patients. After stroke, patients' psychological needs require the full attention of medical professionals and other caretakers.

The observation group outperformed the control group in terms of medication adherence. The caregivers of stroke patients are mostly relatives, avoiding the pressure brought by strangeness to patients, and the compliance of patients is high. This is in line with the previous findings [21, 22]. In addition, the observation group had lower readmission rates than the control group within 12 months after discharge, which is also consistent with previous studies [23-25]. It shows that "Internet + tertiary hospital-primary hospital-family linkage home care" mode plays a significant role in helping patients recover from their illness. Stroke rehabilitation is a long-term process. This nursing model can provide continuous home rehabilitation guidance and psychological support for patients after discharge through the application of network platform, home visit, telephone follow-up and other forms, effectively improving patients' enthusiasm and compliance for rehabilitation, and effectively improving their health.

The results of this study showed that the NIHSS score of patients in both groups decreased after care intervention, and the NIHSS score of patients in the intervention group was significantly lower than that in the control group 12 months after discharge. It is suggested that the "Internet + tertiary hospital-primary hospital-family linkage home care" mode can effectively improve the neurological function of patients, which is consistent with the results of Cheng et al [26]. In addition, the patients' FMA score was improved, and the FMA score of the patients in the intervention group was significantly higher than that of the control group at 12th month after discharge, suggesting that this care mode can effectively improve the patients' limb function and improve their exercise ability. The reason may be that this model guides healthcare professionals to develop a rational rehabilitation plan based on patients' actual condition and adjust it according to rehabilitation process, and guides the patient and their family members to participate together. Through targeted diet guidance training, life skills training, speech rehabilitation training, and limb motor function training, patients' sense of participation in rehabilitation exercise is greatly improved, so that they are willing to actively participate in rehabilitation exercise.

Conclusion

In summary, the "Internet + tertiary hospital-primary hospital-family linkage home care" mode can meet the personalized needs of stroke patients for home-based rehabilitation, and effectively improve patients' self-care ability and treatment compliance, but reduce their negative psychological burden and readmission rates at the same time. It is worthy of clinical application. However, this study still has some limitations: this is a retrospective study with limited sample size, which may have certain sample bias. Therefore, it's application value needs to be further verified in a large sample and multi-center study.

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Disclosure of conflict of interest

None.

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