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Original Article

Effects of continuous nursing on stroke patients during convalescence

Jing Liu[1], Dian Zhong[2], Dan Tian[3], Hongyao Wei[1], Li Li[4], Yunyan Xianyu[5], Shulan Huang[6]

[1]Department of Outpatient, Renmin Hospital of Wuhan University, Wuhan, Hubei, China; [2]Department of Otolaryngology Head and Neck Surgery, Renmin Hospital of Wuhan University, Wuhan, Hubei, China; [3]Department of Emergency, Renmin Hospital of Wuhan University, Wuhan, Hubei, China; [4]Department of Pediatrics, Renmin Hospital of Wuhan University, Wuhan, Hubei, China; [5]Department of Nursing, Renmin Hospital of Wuhan University, Wuhan, Hubei, China; [6]Department of Neurosurgery, Renmin Hospital of Wuhan University, Wuhan, Hubei, China

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Abstract: Objective: To discuss the effect of continuous nursing on stroke patients during convalescence. Methods: Retrospective analysis on medical records of 96 patients with ischemic stroke admitted from July 2017 to April 2018 were carried out. According to different nursing plans, divide patients into observation group (using continuous nursing mode) and control group (using routine nursing mode), and each group has 48 patients. Evaluate the activities of daily living, self-care ability, limb movement function, and quality of life and nursing satisfaction after 3-month nursing intervention of two groups. Results: Before nursing intervention, after 1-month nursing intervention and after 3-month nursing intervention, the BI scores and ESCA scores kept increasing, and the differences of BI scores and ESCA scores at different time points were statistically significant (P<0.001). The BI score and ESCA score before nursing intervention were significantly different from scores after 1-month and 3-month nursing intervention (P<0.001). Before nursing intervention, after 1-month nursing intervention and after 3-month nursing intervention, the FMA scores kept increasing, and the differences of two groups were statistically significant (P<0.05) after 3-month intervention. The FMA score of observation group was significantly higher than control group after 1-month and 3-month nursing intervention (P<0.05). The scores of social function, physical pain, physiological function, mental health and physiological function in observation group were significantly higher than control group after 3-month nursing intervention. The nursing satisfaction of observation group was also significantly higher than control group (P<0.05). Conclusion: Continuous nursing can improve the rehabilitation effect and improve quality of life and nursing satisfaction of stroke patients.

Keywords: Continuous nursing, stroke, convalescence

Introduction

Stroke is a common acute cerebrovascular disease in clinical practice [1]. According to a large number of reports, stroke has high morbidity and mortality and disability rate, which can cause many complications and seriously endanger physical and mental health of stroke patients [2, 3]. At present, due to insufficient popularization of stroke-related health education knowledge, stroke patients lack awareness of the risk of stroke. After hospital-related treatment, stroke patients still have low compliance with relevant nursing guidance. Since hospital care has been completed after leaving hospital, while the focus of nursing care for stroke patients is still in hospital, which results in poor therapeutic effect in convalescence [4, 5]. Effective nursing model is very important for stroke patients during convalescence, and stroke rehabilitation training should be carried out as soon as possible [6]. Continuous rehabilitation nursing after stroke is very important for improving the prognosis [7].

Continuous nursing is a new type of nursing mode which is patient-oriented [8]. In order to improve the daily activities and physical condition of patients, continuous nursing staff develops rehabilitation plans for patients and carries out a variety of nursing models [9].

Relevant reports indicate that continuing care staff adjusts the rehabilitation training plan in

the follow-up process according to patients' condition [10]. Relevant studies have shown that continuous nursing can effectively shorten the rehabilitation process and make up disadvantages of routine nursing [11, 12]. This study is to discuss the effect of continuous nursing on stroke patients during convalescence.

Materials and methods

General information

Carry out retrospective analysis on 96 acute stroke patients who were treated in our hospital. Divide patients into observation group (using continuous nursing mode) and control group (using routine nursing mode), and there were 48 patients in each group. All patients and their families signed informed consent, and the study was approved by the Ethics Committee of the hospital.

Inclusion and exclusion criteria

All patients were treated in our hospital, and all patients met the diagnostic criteria of stroke [13]. Patients with other diseases were excluded; Patients with congenital heart disease, pulmonary and renal dysfunction were excluded. Before the study, all patients and their families shall be informed and they shall sign informed consent. The study has been approved by the Ethics Committee of our hospital.

Nursing methods

The patients in control group were given routine nursing measures, including paying close attention to the vital signs of the stroke patients after leaving hospital, guiding patients on daily life, medication, self-care function exercises and routine psychological nursing. As for observation group, continuous nursing intervention was given based on routine nursing. After patients leaving hospital, relevant medical staff followed up patients by telephone, WeChat and door-to-door visits. The first telephone or WeChat follow-up was carried out on the 3rd day after patient leaving hospital, and the follow-up shall be carried out once a week, and each follow-up shall not be less than 20 minutes. Door-to-door visits shall be carried out once a month, and each follow-up need be recorded truthfully.

The follow-up contents including: (1) rehabilitation of stroke patients: Relevant medical staff shall patiently inquire patients about whether there were adverse complications when drinking water, such as cough, and whether there were limbs numbness and hearing impairment in daily life, and whether there were new symptoms or old disease recurrence. (2) Psychological nursing of stroke patients: Relevant medical staff shall know the psychological state of patients timely through communication. When patients had depression, anxiety and other negative psychological problems, it was necessary to guide caregivers or patient's families to do psychological counseling. (3) Medication compliance of patients: Relevant medical staff shall know whether the patients had corresponding medication on time according to the doctor's advice. Observe medicine effect and adverse side effect after medication, once the patient had adverse reaction, it must be promptly reported to the doctor; (4) After stroke patients leaving hospital, monitor the blood pressure, blood glucose, blood lipids and other monitoring indicators, if the monitoring indicators fluctuated abnormally, it was necessary to report to the attending doctor at the first time. (5) Life nursing: Observe whether the patient's diet need adjust. Suggest patient to control appetite, and to take low-sugar diet and to have more fresh vegetables and fruits and iodine-rich food; animal fat shall be restricted. Pay attention to patient's physical tolerance and the implementation of rehabilitation training program. If the patient was physically intolerant, the rehabilitation therapist shall intervene in time and adjust the rehabilitation plan.

Evaluation of intervention effect

Before intervention, after one-month intervention and after three-month intervention, the Barthel index scale [14] was used to evaluate the functional status of daily living activities of stroke patients, and the total score was 100 points. Self-protection ability was tested by ESCA [15], and the total score was 172. The higher the score was, the stronger the self-protection ability was. The limb movement function was assessed by Simple Fugl-Meyer Assessment Scale (FMA) [16] correspondingly before intervention, after one-month intervention and after three-month intervention. The scores ranged from 0 to 100, and the score and limb

Table 1. General baseline data of patients in both groups [n (%)]

Group	Observation group (n=48)	Control group (n=48)	t/X^2	*P*
Gender			0.169	0.681
Male	28 (58.33)	26 (54.17)		
Female	20 (41.67)	22 (48.83)		
Age (years)	59.25±14.78	60.12±12.32	0.313	0.755
Weight (Kg)	57.74±5.69	57.01±5.88	0.618	0.538
Medical insurance			0.000	0.000
Reimburse	42 (87.50)	42 (87.50)		
Self-pay	6 (12.50)	6 (12.50)		
Escort				
Family	24 (50.00)	23 (47.92)	0.042	0.838
Professional carer	10 (20.83)	11 (22.92)	0.061	0.805
None	14 (29.17)	14 (29.17)	0.000	0.000
Routine blood				
Hb (gm/dl)	9.25±1.98	11.97±3.20	5.008	<0.001
RBC ($\times 10^{12}$/L)	4.22±0.54	5.20±0.38	10.280	<0.001
PLT ($\times 10^9$/L)	157.54±29.03	143.22±30.55	2.354	0.021
Liver function				
ALT (U/L)	22.57±13.62	20.43±10.63	0.858	0.393
AST (U/L)	18.04±8.15	17.29±7.18	0.478	0.634
Renal function				
TP (g/L)	124.50±10.52	76.48±12.60	20.270	<0.001
UREA (mmol/L)	8.12±1.24	4.32±1.55	13.26	<0.001
CRE (μmol/L)	192.12±25.45	100.35±19.06	20.000	<0.001
UA (μmol/L)	589.03±36.42	225.52±55.20	38.080	<0.001

dysfunction severity were inversely proportional. Simple SF-36 scale [17] was used to evaluate the life quality of two groups after 3-month nursing intervention. The main evaluation items were social function, physical pain, physiological function, mental health and physiological function. The higher the score was, the better the condition was. Record nursing satisfaction degrees of two groups after 3-month nursing intervention.

Statistical analysis

Carry out statistical analysis by SPSS20.0 (Asia Analytics Formerly SPSS China). The measurement data was expressed as (X ± S), and the counting data was tested by χ^2 test. Independent Sample t Test was used for comparison between groups at the same time point, and One-way ANOVA Test was used for comparison among groups. When *P* value was less than 0.05, the difference was statistically significant.

Results

Baseline data

There was no significant difference in general data between the two groups (P>0.05), and the data has comparability (**Table 1**).

Nursing intervention improves daily activities ability and self-nursing ability

(1) BI scores before and after nursing intervention in observation group and control group. Before nursing intervention, after 1-month nursing intervention and after 3-month nursing intervention, the BI scores of observation group were on the increase, and BI scores at different time points were statistically significant (P<0.001). Before nursing intervention, after 1-month nursing intervention and after 3-month nursing intervention, the BI scores of control group were on the increase. The BI score of patients before nursing intervention was statistically different from BI scores after 1-month and 3-month nursing intervention (P<0.001). The BI scores had no significant difference between observation group and control group before nursing intervention (P>0.05), while the BI scores of the observation group were significantly higher than control group after 1-month nursing intervention and 3-month nursing intervention (P<0.001). According to above results, we believe that continuous nursing can improve stroke patients' activities of daily living better than routine nursing (**Table 2**).

(2) ESCA scores before and after nursing intervention in observation group and control group. Before nursing intervention, after 1-month nursing intervention and after 3-month nursing intervention, the ESCA scores of observation group were on the increase, and ESCA scores at different time points were statistically significant (P<0.001). Before nursing intervention, after 1-month nursing intervention and after

Table 2. Comparison of BI scores before and after nursing intervention in two groups

Group	Observation group (n=48)	Control group (n=48)	t	*P*
Before intervention	43.98±12.25*	43.78±12.36@	0.080	0.937
Intervention for 1 month	80.15±12.45*,#	63.44±11.70	6.776	<0.001
Intervention for 3 months	90.14±11.36*,#	66.28±11.26	10.330	<0.001
F	195.600	51.920		
P	<0.001	<0.001		

Note: *indicates that the scores of the group are statistically significant compared with other time points in the group (P<0.001); @indicates that the scores of the group are statistically significant compared with other time points in the group (P<0.001); #indicates a comparison with the group at the same time, the difference was statistically significant (P<0.001).

Table 3. ESCA scores before and after two groups of nursing interventions

Group	Observation group (n=48)	Control group (n=48)	t	*P*
Before intervention	77.27±5.47*	78.75±5.13@	1.367	0.175
Intervention for 1 month	111.68±12.70*,#	91.56±8.28	9.194	<0.001
Intervention for 3 months	134.26±11.57*,#	96.38±9.63	17.43	<0.001
F	364.800	63.720		
P	<0.001	<0.001		

Note: *indicates that the scores of the group are statistically significant compared with other time points in the group (P<0.001); @indicates that the scores of the group are statistically significant compared with other time points in the group (P<0.001); #indicates a comparison with the group at the same time, the difference was statistically significant (P<0.001).

3-month nursing intervention, the ESCA scores of control group were on the increase. The ESCA score of patients before nursing intervention was statistically different from ESCA scores after 1-month and 3-month nursing intervention (P<0.001). The ESCA scores had no significant difference between observation group and control group before nursing intervention (P>0.05), while the ESCA scores of the observation group were significantly higher than control group after 1-month nursing intervention and 3-month nursing intervention (P< 0.001). According to above results, we believe that continuous nursing can improve stroke patients' daily self-care ability better than routine care (**Table 3**).

Nursing intervention improves limb function

Before nursing intervention, after 1-month nursing intervention and after 3-month nursing intervention, the FMA scores of observation group were on the increase, and FMA score before nursing intervention and score after 3-month nursing intervention were statistically significant (P<0.001). Before nursing intervention, after 1-month nursing intervention and after 3-month nursing intervention, the FMA scores of control group were on the increase, and FMA score before nursing intervention and score after 3-month nursing intervention were statistically significant (P<0.05). The FMA scores had no significant difference between observation group and control group before nursing intervention (P>0.05), while the FMA scores of the observation group were significantly higher than control group after 1-month nursing intervention and 3-month nursing intervention (P<0.05). According to above results, we believe that continuous nursing can improve the limb dysfunction of stroke patients better than routine nursing (**Table 4** and **Figure 1**).

Nursing intervention improves quality of life

After 3-month nursing intervention, the scores of social function, physical pain, physiological function, mental health and physiological function in observation group were significantly higher than control group (P<0.001) (**Table 5**).

Nursing intervention improves nursing satisfaction

The nursing satisfaction of observation group was significantly higher than control group, and the nursing dissatisfaction of observation group was significantly lower than that of the control group (P<0.05) (**Table 6**).

Discussion

Stroke has serious adverse impact on physical and mental health and quality of life of related patients. The incidence of stroke is affected by the changing lifestyle and aging trend of popu-

Table 4. FMA scores before and after nursing intervention in the two groups

Group	Observation group (n=48)	Control group (n=48)	t	*P*
Before intervention	54.25±22.36	54.28±21.75	0.007	0.995
Intervention for 1 month	66.18±20.25#	57.24±20.43	2.153	0.034
Intervention for 3 months	74.28±21.32*,#	63.41±20.54*	2.544	0.013
F	10.710	2.381		
P	<0.001	0.096		

Note: *indicates that the score of this group is statistically significant compared with the score before intervention in the group (P<0.05); #indicates the same time between the groups, the difference is statistically significant (P<0.05).

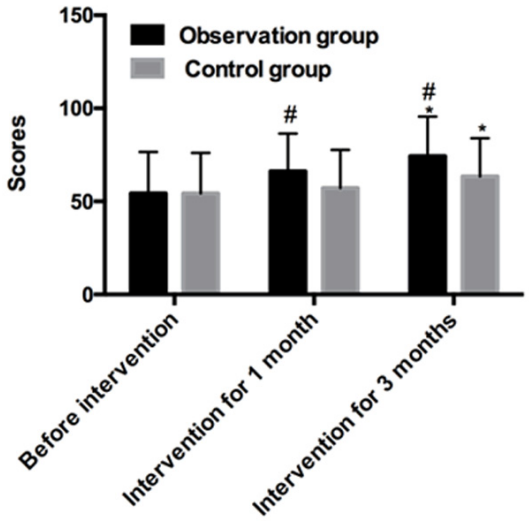

Figure 1. Comparison of limb dysfunction improvement before and after nursing intervention in observation group and control group. Before nursing intervention, after 1-month nursing intervention and after 3-month nursing intervention, the FMA scores of both groups were on the increase, and FMA score before nursing intervention and score after 3-month nursing intervention were statistically significant (P<0.05). The FMA scores of observation group were significantly higher than control group after 1-month nursing intervention and 3-month nursing intervention (P<0.05). Remarks: * indicates that the difference of scores were statistically significant, compared with scores before intervention (P<0.05); # indicates that the difference of scores were statistically significant, compared with scores of control group at the same time point (P<0.05).

lation. The number of stroke patients shows an increasing trend year by year [18]. Although the clinical treatment effect of stroke patients has been improved, the disability rate still has not been effectively reduced after treatment [19]. Relevant studies pointed out that in the process of limb function recovery, standardized rehabilitation nursing is not only conducive to effective control of disease condition, but also plays a vital role in improving the quality of life of patients [20]. Continuous nursing intervention makes nurses no longer confined in the hospital. Continuous nursing intervention implements the idea of holistic nursing and it extends the hospital nursing to the family after patients leaving hospital [21]. During the whole continuous nursing process, through the continuous and dynamic interaction among relevant medical staff and patients and their families, the functional rehabilitation of patients can be promoted and the quality of life can be improved [22]. In order to greatly promote the recovery effect, continuous nursing staff provides continuing rehabilitation guidance and health care knowledge to stroke patients after leaving hospital [23]. Therefore, this study observed the improvement of daily activities and self-care ability of the two groups on stroke patients before and after nursing intervention, to evaluate the effect of continuous nursing in rehabilitation period, and to provide reference for improving continuous nursing system.

In this study, the Barthel Index was used to evaluate the functional status of patients' daily life activities before intervention, after 1-month intervention and after 3-month intervention. Before nursing intervention, after 1-month nursing intervention and after 3-month nursing intervention, under continuous nursing and routine nursing, both BI scores were on the increase, and BI scores at different time points were statistically significant. However, after 1-month nursing intervention and after 3-month nursing intervention, the BI scores of patients under continuous nursing were significantly higher than scores of patients under routine nursing, and the differences were statistically significant. Therefore, we believe that continuous nursing can improve stroke patients' activities of daily living better than routine nursing. The study indicated that Barthel Index was a simple and reliable method for assessing the quality of life in rehabilitation institutions [24]. The BI score not only reflects the elderly care demand, but also can be used to detect chang-

Table 5. Comparison of quality of life after 3 months of nursing intervention in the two groups

Group	n	Social function	Somatic pain	Physiological function	Mental health	Physiological function
Observation group	48	128.13±4.76	138.46±6.24	120.24±4.70	99.97±4.15	137.74±5.23
Control group	48	70.35±2.90	71.43±3.68	70.48±5.10	70.55±3.26	72.84±3.47
t		71.820	64.110	49.71	38.620	71.640
P		<0.001	<0.001	<0.001	<0.001	<0.001

Table 6. Nursing satisfaction of the two groups of patients [n (%)]

Group	N	Great satisfaction	Satisfied	Not satisfied	Total satisfaction
Observation group	48	37 (77.08)	10 (20.83)	1 (2.08)	47 (97.92)
Control group	48	20 (41.67)	18 (37.50)	10 (20.83)	38 (79.17)
X^2		3.859	3.227	8.317	8.317
P		0.050	0.072	0.004	0.004

es of independent living activities [25]. At present, a large number of studies have confirmed that continuous nursing is better than routine nursing to improve patients' daily living activities [26]. Before nursing intervention, after 1-month nursing intervention and after 3-month nursing intervention, the improvement of self-care ability of two groups showed that ESCA scores under both continuous nursing and routine nursing were on the increase. After 1-month nursing intervention and after 3-month nursing intervention, ESCA scores under continuous nursing were significantly higher than scores under routine nursing, and the differences were statistically significant. A similar study showed that the ESCA score reflected patients' self-care ability. The higher the score is, the stronger the self-care ability is [27]. Therefore, we believe that continuous nursing can improve stroke patients' daily self-care ability better than routine nursing. Then, in the follow-up nursing process, we found the FMA scores of two groups were on the increase, and the differences of FMA scores before intervention and scores after 3-month intervention were statistically significant in both groups. As for patients under continuous nursing, after 1-month intervention and 3-month intervention, FMA scores were significantly higher than scores under routine nursing, and the differences were statistically significant. Therefore, we believe that continuous nursing is better than routine nursing in improving limb dysfunction for stroke patients. Relevant reports confirm that the Fugl-Meyer scale, which is the earliest scale in the world, is often used for quantitative assessment of motor function in stroke. Its score is inversely proportional to the severity of limb dysfunction, and the higher the score is, the better the improvement of limb dysfunction is [16]. Finally, we compared the quality of life and nursing satisfaction of the two groups after 3-month nursing intervention. After 3-month nursing intervention, the scores of social function, physical pain, physiological function, mental health and physiological function of patients under continuous nursing intervention were significantly higher than scores of patients under routine nursing intervention, while the nursing satisfaction score of patients under continuous nursing intervention was also significantly higher than scores of patients under routine nursing intervention, and the differences were statistically significant. Therefore, we believe that continuous nursing intervention is better than routine nursing intervention in improving the quality of life of stroke patients in convalescent period, and patients are highly satisfied with continuous nursing, which is worthy of clinical promotion. A large number of similar studies indicate that continuity nursing has a better effect on improving the quality of life of patients [28].

In this study, there are still some deficiencies, for example, intervention follow-up results can only indicate the improvement in 3-month convalescent period, and later results are not clarified, which may cause some impact on the results. Therefore, we will follow up patients according to the relevant patient data in later period, and we will pay extensive attention to relevant reports to continuously improve the study.

Conclusion

Continuous nursing is more effective than routine nursing in improving self-care ability, daily activity ability and quality of life on stroke

patients, and it has high clinical application value.

Disclosure of conflict of interest

None.

Address correspondences to: Shulan Huang, Department of Neurosurgery, Renmin Hospital of Wuhan University, No. 238, Jiefang Road, Wuhan 430060, Hubei, China. Tel: +86-13707104366; E-mail: unanuang@163.com

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