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Original Article

Responsibility system nursing can reduce the pressure sores in cerebral infarction patients and improve their awareness

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Abstract: This study explores the effect of responsibility system nursing on pressure sores and the awareness of cerebral infarction patients. The influence of the introduction of the responsibility system of holistic nursing in treating cerebral infarction patients' pressure sores understanding of the disease is discussed. A total of 131 patients with cerebral infarction admitted to our hospital from February 2017 to January 2019 were recruited as the study cohort; among them, 67 patients under routine standard intervention were set as the control group (CG), and 64 patients under the responsibility system of holistic nursing were set as the responsibility system group (RSG). Disease awareness, pressure sores, the psychological state, the daily living ability scores (ADL), the motor function scores (FMA), the nerve defect degree scores (NIHSS), the quality of life (GQIOLI-74) scores, and the nursing satisfaction were observed and evaluated in the two groups. The cognitive knowledge scores in five areas (disease, diet, exercise, medication, and self-care) in the RSG were higher than they were in the CG ($P<0.05$). After the nursing, the SAS and SDS scores in the RSG were lower than they were in the CG ($P<0.05$). There were no differences in the NIHSS, FMA and ADL scores in the two groups before the nursing ($P>0.05$). After the nursing, the NIHSS and ADL scores of both groups decreased, but the FMA scores increased, and the RSG changes were more significant than they were in the CG ($P<0.05$). The total incidence of pressure sores in the RSG was lower than it was in the CG ($P<0.05$). The patients' quality of life indexes in the RSG were dramatically better than those in the CG in their psychological state, social function, physiological function, and emotional function ($P<0.05$). The total satisfaction with the nursing in the RSG was dramatically higher than it was in the CG ($P<0.05$). It is a feasible intervention strategy to carry out the responsibility system of holistic nursing in the rehabilitation treatment of cerebral infarction patients, and it can significantly improve their pressure sores and raise their awareness.

Keywords: Responsibility system nursing, cerebral infarction, pressure sores, awareness

Introduction

Cerebral infarction, also known as ischemic stroke, is a cerebral circulatory disorder disease with a rapid onset and a relatively high incidence. It is mainly caused by the formation of pathological states such as blood supply disorders or cerebral hypoxia due to insufficient cerebral blood supply, cerebral thrombus block or increased blood viscosity, resulting in local brain tissue necrosis or cerebral softening [1, 2]. It accounts for a high proportion of clinical morbidity, and most patients experience a sudden loss of consciousness, shock, arrhythmia, dehydration, and other diseases [3, 4]. The clinical manifestations are motor dysfunction and neurological deficit, which are the most familiar and most influential, and their most typical manifestation is hemiplegia [5, 6]. At present, the main methods of treating cerebral infarction include surgery, thrombolysis, and conservative treatment. Thrombolytic therapy is usually the first choice, but there is a risk of cerebral hemorrhage. Some patients miss the opportunity for this treatment or are no longer suitable for it when receiving treatment. Only conservative treatment can relieve the disease [7, 8]. In recent years, with the advances in medical care, the mortality of patients with cerebral infarction has been reduced corre-

spondingly, but there is still a high proportion of patients suffering from cognitive and physical disabilities after their illnesses, bringing about a great burden on families due to the physical health and life safety injuries [9]. Therefore, clinically, effective and correct nursing intervention and guidance combined with the clinical symptoms and signs of patients play a vital role in their rehabilitation and the recurrence of cerebral infarction, helping to restore their self-care and working ability to the maximum extent, and promoting the recovery of their cognitive function and improving their prognosis [10, 11]. Responsibility system nursing takes patients as the nursing center, and responsible nurses carry out planned and purposeful health management for them to ensure a smooth implementation of the treatment process [12]. The purpose of this study is to observe the improvement of pressure sores and the awareness of cerebral infarction patients under the responsibility system nursing intervention, hoping to make a contribution to improving nursing work in order to better improve the quality of nursing and improve the patients' prognosis. The report is as follows.

Data and methods

General information

From February 2017 to January 2019, 131 patients with cerebral infarction in our hospital were selected; among them, 67 patients under routine standard intervention were set as the control group (CG), and 64 patients under the responsibility system of holistic nursing were set as the responsibility system group (RSG). There were 65 males and 66 females, with an average age of 62.47±2.76 years and an average course of the disease of 18.42±2.45 months. There were 14 cases of asthma, 37 cases of diabetes and 58 cases of hypertension. The inclusion criteria were: (1) patients who were diagnosed with cerebral infarction after MRI and CT examinations; (2) patients with stable vital signs and clear minds. The exclusion criteria were: (1) patients who resisted and did not cooperate with the nursing operations; (2) patients with severe consciousness disorders; (3) patients with a previous history of brain surgery or major organ dysfunction. The implementation of the nursing operations in this research process were in line with the standards determined by the ethics committee, and it was approved.

Nursing methods

The CG received routine intervention (clinical treatment such as cerebral edema, microcirculation, and coagulation function improvement) and body rehabilitation such as early rehabilitation training and functional exercise according to conventional standards. The RSG received responsibility system nursing on this basis. (1) Ward environment protection: Cleanliness and tidiness of the ward temperature, humidity and overall environment during hospitalization were ensured, subject to the comfort and kindness of the patients, and they should regulate the hospital environment sanitation with warmth and humanity. (2) Division of labor mode: In combination with the existing manpower status of the hospital and the experience of the nursing workers, the nursing supervisor I allocates the nursing work according to the actual situation, reasonably plans the whole process of the operation of clinical nursing work, fully and appropriately mobilizes and utilizes the available human resources in the department, and ensures a seamless connection and an uninterrupted nursing level as far as possible. (3) Dynamic management: Nurses passed the competitive appointment mode exam, and carried out clinical on-the-job learning. Those who meet the standards of responsibility, experience and professional level were selected as team leaders to be responsible for the supervision and guidance of the nursing team members, and appropriate material and spiritual encouragement were given to those who performed well. (4) Scheduling system: They should plan a reasonable APN typesetting mode suitable for our department, increase the labor output in weak time periods, reduce the deficiencies and consumption during shift changes, and strictly control the quality and efficiency of the nursing services. (5) Giving full play to the advantages of specialized nursing: Combining basic and specialized knowledge with nursing, they arranged and perfected the nursing workflow and clinical health education according to the acceptability of the cerebral infarction patients, building health education publicity columns in the ward, and extending the scope of nursing services to achieve the purpose of enhancing its connotation. (6) Rehabilitation nurs-

ing: After the patients were admitted to the hospital, the responsible nurses were designated to train them, and their daily life activities, body posture, sleeping posture, and other training were carefully carried out. Active cognitive ability intervention guidance analysis was carried out for some cerebral infarction patients who had lost their cognitive abilities, and their family members were instructed to actively cooperate with the work of the nursing staff and to participate appropriately. (7) Psychological nursing: The responsible nurses paid attention to the cerebral infarction patients with significant personality changes, listened to and respected their demands, gave them full encouragement, created a relaxed nurse-patient communication atmosphere, and built up their rehabilitation confidence.

Outcome measures

(1) Disease awareness score: A survey was conducted, and it included 5 questions each on disease knowledge, diet knowledge, exercise knowledge, medication knowledge, and self-care knowledge, for a total possible score of 20 (totaling 100 points). The higher the score was, the better the knowledge understanding was [13]. (2) The pressure sores in patients in both groups were observed and recorded; degree I: There was redness, numbness, and even blisters on the skin; degree II: The skin was purplish red with blisters or induration under the skin; degree III: There was an infection in the superficial tissue, and it formed ulcers and festered, and there was even necrosis in the local tissue. (3) Mental state: It was evaluated using the Self-Rating Anxiety Scale (SAS) and he Self-rating Depression Scale (SDS). Each scale contains 20 items, for a total possible score of 100. The higher the score was, the more severe the anxiety and depression were [14, 15]. ADL was used to assess their daily living ability, with a total of 14 items. The total score was [16]. (4) Motor function: It was judged via the Fugl-Meyer scale (FMA), including the lower and upper limbs. The higher the score was, the better the motor ability of the limbs was [17]. (5) Degree of nerve defect: The lower the NIHSS score was, the better the recovery [18]. (6) The quality of life was assessed using the GQOLI-74 scale, which was divided into psychological state, social function, physiological function, and emotional function. A high score indicated a good quality of life [19]. (7) The satisfaction degree of nursing was evaluated using the self-made satisfaction questionnaire of our hospital, which was divided into very satisfied, satisfied, and unsatisfied, and those who were very satisfied and satisfied were included in the calculation.

Statistical methods

The experimental data were processed through statistical source software (version: SPSS 21.0), and χ^2 (or t) tests were used to test the counting (or measurement) data, which were expressed by the rate (mean ± standard deviation). The figures were drawn using GraphPad Prism 8 in this experiment, and $P<0.05$ was considered statistically significant.

Results

Comparison of the general data between the two groups

There were no significant differences in terms of gender, age, or complications between the two groups ($P>0.05$), as shown in **Table 1**.

Comparison of the disease cognition of the cerebral infarction patients after the nursing intervention

The cognitive knowledge scores in the five areas (disease, diet, exercise, medication, and self-care) of the patients in the RSG were higher than those in the CG ($P<0.05$), as shown in **Figure 1**.

Comparison of anxiety and depression between the two groups

After the nursing, the SAS and SDS scores of the RSG were lower than those of the CG ($P< 0.05$), as shown in **Table 2**.

Comparison of the NIHSS scores in the two groups

There was no difference in the NIHSS scores between the two groups before the nursing ($P>0.05$). After the nursing, the scores in both groups decreased, and the decrease in the RSG was relatively more significant ($P<0.05$). More details are shown in **Table 3**.

Table 1. Comparison of the general data of the patients in the two groups

Group	Control group (CG) (n=67)	Responsibility system group (RSG) (n=64)	t/X^2	P
Gender (case)			0.180	0.671
Male	34 (50.75)	31 (48.44)		
Female	33 (49.25)	33 (51.56)		
Age (years)	62.42±2.73	62.51±2.78	0.187	0.852
Course of the disease (months)	18.35±2.42	18.53±2.47	0.421	0.674
Combined asthma (case)			0.479	0.489
Yes	8 (11.94)	6 (9.38)		
No	59 (88.06)	58 (90.63)		
Diabetes (case)			0.221	0.638
Yes	20 (29.85)	17 (26.56)		
No	47 (70.15)	47 (73.44)		
Combined hypertension (case)			0.325	0.569
Yes	31 (46.27)	27 (42.19)		
No	36 (53.73)	37 (57.81)		
Area of infarction (case)			1.913	0.752
Multiple lacunar cerebral infarction	15 (22.39)	12 (18.75)		
Occipital lobe infarction	5 (7.46)	4 (6.25)		
Frontal lobe infarction	12 (17.91)	11 (17.19)		
Cerebral infarction	8 (11.94)	12 (18.75)		
Basal ganglia infarction	27 (40.30)	25 (39.06)		

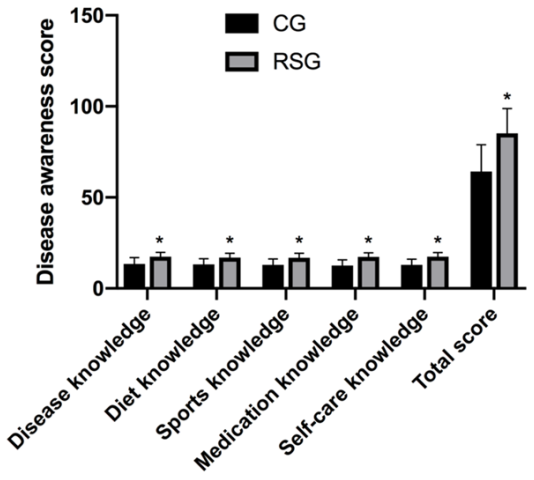

Figure 1. Comparison of the cerebral infarction patients' understanding of the disease after the nursing intervention. The patients in the RSG scored higher than the patients in the CG in five aspects of cognitive knowledge (disease, diet, exercise, medication, self-care). Note: * represents P<0.05 compared with the CG.

Comparison of the motor function scores between the two groups

There was no difference in the FMA scores between both groups before the nursing (P>0.05). After the nursing, the scores in both groups increased, and the increase in the RSG was relatively more significant (P<0.05). More details are shown in **Table 4**.

Patients with pressure sore changes in the two groups

The total incidence of pressure sores in the RSG was lower than it was in the CG (P<0.05), as shown in **Table 5**.

Comparison of the daily living ability scores between the two groups

There was no difference in the ADL scores between the two groups before the nursing (P> 0.05). After the nursing, both groups decreased, and the decrease in the RSG was relatively more significant (P<0.05). More details are shown in **Table 6**.

Comparison of the quality of life between the two groups

The quality of life indexes of the responsible patients were markedly better than those in the CG in terms of psychological state, social function, physiological function, and emotional fun-

Table 2. Comparison of the patients' anxiety and depression in both groups

Group	Control group (CG) (n=67)	Responsibility system group (RSG) (n=64)	t	P
SAS score	57.35±5.24	45.64±4.53	13.660	<0.001
SDS score	55.36±5.37	48.25±4.82	7.962	<0.001

Table 3. Comparison of the NIHSS scores of the patients in the two groups

Group	Control group (CG) (n=67)	Responsibility system group (RSG) (n=64)	T	P
NIHSS scores before nursing	12.33±3.22	12.34±3.31	0.018	0.986
NIHSS scores after nursing	8.35±1.32	5.23±1.22	14.030	<0.001
t	9.361	16.120		
P	<0.001	<0.001		

Table 4. Comparison of the patients' motor function scores in the two groups

Group	Control group (CG) (n=67)	Responsibility system group (RSG) (n=64)	t	P
FMA scores before nursing	43.53±10.62	44.46±10.57	0.502	0.616
FMA scores after nursing	57.24±10.83	71.93±10.93	7.725	<0.001
t	7.398	14.450		
P	<0.001	<0.001		

ction (P<0.05). More details are shown in **Figure 2**.

Comparison of the nursing satisfaction between the two groups

The total satisfaction with the nursing in the RSG was markedly higher than it was in the CG (P<0.05), as shown in **Table 7**.

Discussion

The onset of cerebral infarction is mainly due to central nerve damage, and the specific clinical manifestations do not appear at its initial stage, so it is easily confused with intracranial hematoma, craniocerebral trauma, and other diseases [20]. The clinical treatment of cerebral infarction should improve the blood supply in brain tissue, protect brain cells, and scavenge free radicals as the main outcomes. The treatment time is usually long, but at present, no matter the treatment method, it is not guaranteed to be low risk, and it is difficult to achieve the effect of effectively improving patients' language and limb dysfunction [21]. After those with acute onset stayed in hospital, due to the lack of medical resources and the high cost of health services, the patients who are stabilized were generally discharged, and the rehabilitation treatment and training continued after they were returned to their families or communities, which would had a negative impact on their quality of life [22]. Therefore, it is necessary to carry out a scientific nursing intervention during the treatment of patients to achieve a primary or secondary prevention effect, so as to achieve the purpose of optimizing the treatment effect and avoiding complications. Responsibility system nursing can ensure the orderly progress of nursing measures by intervening in the early stage of treatment in advance to formulate more normative nursing procedures [23]. In order to better standardize the nursing of patients with pressure sores and cerebral infarction, the responsibility system of holistic nursing is implemented in the rehabilitation treatment of cerebral infarction patients to observe the improvement of pressure sores and disease awareness.

Most cerebral infarction patients' body functions gradually decline with the treatment time being so long. Conventional nursing only pays attention to the implementation of various medical orders and the basic nursing operations, ignoring the importance of sharing health knowledge and of psychological nursing, which makes their awareness of the disease not well improved. This study found that patients in the RDG after nursing were better than those in the CG in various cognitive knowledge scores and psychological state improvements. Some stud-

Table 5. Changes in the patients' pressure sores in both groups [n (%)]

Group	Control group (CG) (n=67)	Responsibility system group (RSG) (n=64)	X^2	P
Degree I of pressure sores	6 (8.96)	3 (4.69)	-	-
Degree II pressure sores	4 (5.97)	2 (3.13)	-	-
Degree III pressure sores	2 (2.99)	0	-	-
Total incidence of pressure sores	12 (17.91)	5 (7.81)	4.421	0.036

Table 6. Comparison of the daily living ability scores of the patients in the two groups

Group	Control group (CG) (n=67)	Responsibility system group (RSG) (n=64)	t	P
ADL scores before nursing	32.33±8.67	31.96±8.59	0.245	0.807
ADL scores after nursing	25.34±5.13	19.96±3.97	6.691	<0.001
T	5.680	10.140		
P	<0.001	<0.001		

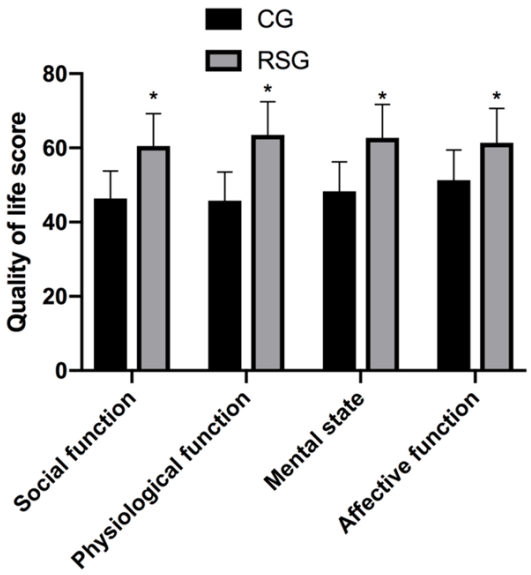

Figure 2. Comparison of the quality of life indexes between the two groups. The patients in the RSG were significantly better than those in the CG in terms of their psychological state, social function, physiological function, emotional function, and other quality of life indicators. Note: * represents P<0.05 compared with the CG.

ies revealed that [24] responsibility system nursing adheres to the principle of taking patients as the center, implementing a comprehensive evaluation plan for them, finding out possible nursing-related problems that need to be solved in the nursing process, and formulating a nursing plan applicable to them so as to actively cooperate with the treatment and nursing operations after the patients and their families' understanding of the diseases is greatly improved, thus smoothly increasing the efficiency of the treatment and nursing work. It indicates that the implementation of responsibility system nursing has a great influence on the patients' psychology and cognition. As for the recovery of their body functions, we observed both their neurological and motor functions. The research results revealed that there were no remarkable differences in the indexes between the two groups before the nursing was carried out, but the neurological improvement and motor ability in the RSG after nursing was better than it was in the CG. Previous studies have shown that [25, 26] responsibility system nursing helps patients recover and retain their motor function as soon as possible by setting up dedicated nursing teams to strengthen their rehabilitation training and keep the training progressing step by step, and adjusting the training and rehabilitation plan appropriately according to their own conditions, which is also instrumental in the recovery of neurological function. The occurrence of pressure sore symptoms in cerebral infarction patients is tied to the need to stay in bed for a long period of time. By observing their improvement of those symptoms, it was found that the total incidence of pressure sores in the RSG was lower than it was in the CG. Previous studies have shown [27] that during the specific implementation of the nursing plan, the nursing staff formulated a detailed system for standardized operations on measures such as turning them over regularly, providing soft pillows, helping them choose comfortable body positions, and improving their immunity, which is conducive to pro-

Table 7. Comparison of the nursing satisfaction of the patients in the two groups [n (%)]

Group	Control group (CG) (n=67)	Responsibility system group (RSG) (n=64)	X^2	P
Very satisfied	21 (31.34)	33 (51.56)	-	-
Satisfied	27 (40.30)	23 (35.94)	-	-
Dissatisfied	19 (28.36)	8 (12.50)	-	-
Total nursing satisfaction	48 (71.64)	56 (87.50)	8.000	0.005

moting their blood circulation and fully preventing the occurrence of pressure sores. And we also evaluated their living ability and quality of life, and found that the living ability and the quality of life of the patients in the RSG were higher than they were in the CG. Responsibility system nursing provides good and professional systematic nursing measures in the whole process. Under the guidance of nursing staff, family members adopt a family self-care mode to give the patients full support and care so as to improve their Zunyi behavior rate and overall rehabilitation effect. This reveals that responsibility system nursing can improve the quality of life and abilities of patients by standardizing nursing measures. Ultimately, we investigated the patient satisfaction degree in the nursing process, and the results indicated that the satisfaction degree was higher after the implementation of the responsibility system nursing. This shows that the patients' and their families' degree of satisfaction with the nursing has been greatly improved through systematic and orderly nursing, the smooth communication with them, and the professional strengthening of the nursing operation.

Conclusion

Cerebral infarction patients are suitable for responsibility system nursing, which can improve their neurological and motor functions, have an impact on the benign transformation of their pressure sores, and strengthen their understanding of the disease. However, there are still some relative limitations in the discussion of the nursing results in this study. For example, we did not distinguish the time period of nursing after the onset of the disease, so as to better distinguish the impact of the nursing operation on the cerebral infarction patients, and we did not discuss the relationship between the improvement of their psychological state and disease understanding degree in detail. A concrete demonstration is conducive to us to adopt faster and more effective ways to improve the patients' degree of understanding of cerebral infarction. These limitations will be the experimental direction of our follow-up continuous exploration in order to better improve the late-stage care of cerebral infarction patients.

Disclosure of conflict of interest

None.

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