

Original Article

Effect evaluation of continuing care and psychological intervention in convalescent phase of stroke

Wenjuan Liu¹, Yimiao Gong², Yudian Gong³

¹Department of Science and Education, Yantai Municipal Laiyang Central Hospital, Yantai City, Shandong Province, China; ²Department of Clinical Psychology, Teachers College, Columbia University, New York City, United States of America; ³Dean's Office, Psychological Rehabilitation Hospital of Yantai City, Yantai City, Shandong Province, China

Received November 15, 2017; Accepted December 22, 2017; Epub March 15, 2018; Published March 30, 2018

Abstract: Objective: To investigate the effect of continuing care and psychological intervention on the treatment compliance and negative emotion of the patients and their family members in the convalescent phase of stroke. Methods: One hundred and twenty-eight stroke patients in the convalescent phase treated at Yantai Municipal Laiyang Central Hospital from March 2016 to March 2017, and 128 accompanying family members were selected and randomly divided into experimental group and control group, with 64 patients and 64 family members in each group. The patients in two groups received the same clinical nursing during hospitalization. The control group received routine follow-up within 6 months after discharge, while the experimental group was given continuing care and psychological intervention on the basis of routine follow-up. The activity of daily living (ADL), treatment compliance, case fatality rate and satisfaction of the patients and negative emotion of their family members in the two groups were evaluated. Results: Barthel ADL index, treatment compliance, and satisfaction of patients and their family members in the control group were lower than those in the experimental group, while the self-rating anxiety scale score of family members and the case fatality rate of patients were higher than those in the experimental group with statistically significant differences ($P < 0.05$). Conclusion: There is a significant effect of continuing care and psychological intervention inpatients in the convalescent phase of stroke, which can obviously improve the treatment compliance and ADL, increase the satisfaction, reduce the case fatality rate of patients and improve the negative emotion of their family members.

Keywords: Stroke recovery, continuing care, psychological intervention

Introduction

Stroke has now become one of the main causes of disability and death among adults; studies have shown that patients with stroke have varying degrees of neurological function defect, and about 2/5 patients can't take care of themselves [1, 2]. The depressing trend brings great economic and psychological burden to patients' family and society, and the duration of stroke recovery is long; therefore, later functional recovery becomes the key factor to improve the stroke sequelae and patients' life quality [3, 4]. However, some patients, especially those who discharge from hospital, have poor treatment compliance, resulting in poor effect of functional recover training [5, 6]. In addition, the negative emotion of family members is not conducive to the recovery, and will influence the coordination in the recovery, so it is necessary

to carry out continuing care and psychological intervention for the stroke patients in the convalescent phase. To effectively improve the recovery rate of stroke patients and alleviate patients' suffering, various recovery nursing modes are gradually discovered by scholars and applied to the recovery therapy of stroke. The purpose of this study is to investigate the effects of continuing care and psychological intervention on the treatment compliance, satisfaction, and Barthel ADL index of the patients and negative emotion of their family members in the convalescent phase of stroke.

Materials and methods

Clinical data

One hundred and twenty-eight stroke patients in the convalescent phase who were treated at

Effect evaluation of continuing care and psychological intervention

Yantai Municipal Laiyang Central Hospital from March 2016 to March 2017 and 128 accompanying family members were selected and randomly divided into experimental group and control group, with 64 patients and 64 family members in each group. The patients in two groups received the same clinical nursing during hospitalization. The control group received routine follow-up for 6 months after discharge, while the experimental group was given continuing care and psychological intervention on the basis of routine follow-up. This study was approved by local Ethical Committee and informed consent was got from every eligible patient. The treatment compliance, activity of daily living (ADL), negative emotion of the stroke patients and their family members in the two groups were evaluated. The control group consisted of 33 males and 31 females, aged 41-73 years, with an average of 56.1 ± 4.2 years, and the experimental group consisted of 35 males and 29 females, aged 43-75 years, with an average of 58.3 ± 4.3 years. There was no significant difference between the two groups in age, sex and medical history, which was comparable ($P > 0.05$).

Treatment and nursing methods

Patients in two groups were treated with the same routine treatment and recovery nursing during their stay in hospital. The patients in the control group received routine follow-up for 6 months after discharge. Their condition, medicine taken and functional recovery training were concerned and asked, and their questions were answered by the paramedics. The experimental group was given continuing psychological care on the basis of routine follow-up, and psychological intervention was performed after their condition was stable. The details were as follows.

Patients received family-centered recovery training and self-care ability training before they were discharged. Besides, family care plan was made and WeChat platform was established at the same time, so that patients could ask daily questions and gain answers after discharge, and the paramedics could supervise the medicine taken, recent exercises and diet condition of patients to ensure patients had balanced caloric intakes and reasonable exercises. Within one month after discharge, the paramedics carried out telephone follow-up 2 times a week, and home follow-up once a week,

provided psychological counseling for patients or their family members with poor mental status, introduced the possible problems and complications of stroke and emergency response measures, guided the patients to do proper recovery training, and informed them the strength of the whole recovery process should be appropriate instead of seeking quick success and instant benefits. Within 2-3 months after discharge, the paramedics carried out telephone follow-up once a week, and home follow-up once every two weeks, and repeated the above instructions. Within 4-6 months after discharge, the paramedics carried out telephone follow-up twice a month, and home follow-up once a month, and repeated the above instructions; in addition, psychological intervention was performed, including psychological health education, psychological counseling, cognitive behavioral therapy, etc.; the patients' treatment compliance, ADL, and negative emotion of their family members were evaluated at the end of the sixth month [7, 8].

Therapeutic evaluation

Barthel ADL index was used for the assessment of ADL, including 10 items such as walking, eating, dressing, defecation, etc. Barthel ADL index ranges from 0 to 100: 100 means that patients' have good basic ADL, don't need to ask for help, and are able to control their defecation, eat by themselves, wear, transfer from bed to chair, bath, walk at least one block, as well as go upstairs and downstairs; 0 indicates that they have poor body function and independent ability, and need help for their all daily life. The higher the score is, the better the ADL is [9, 10].

Self-rating anxiety scale (SAS) was applied to assess caregiver's negative emotion of every patient. SAS is a 20-item self-report assessment device built to measure anxiety levels, based on scoring in 4 groups of manifestations: cognitive, autonomic, motor and central nervous system symptoms. Scaled scores will be gained by equation as follows: $INT (20\text{-item sum} \times 1.25)$. The higher the score is, the worse the symptoms are. Scores below 50 refer to no anxiety, and lower score matches with better mental status [11, 12].

Treatment compliance was evaluated in 3 grades: complete compliance, basic compliance and non-compliance. Complete compli-

Effect evaluation of continuing care and psychological intervention

Table 1. Patient characteristics in the two groups

Group	Case	Gender (male/female)	Age (years)	BMI (kg/m)	Course of disease (d)	Cerebral hemorrhage/cerebral infarction
Experimental group	64	35/29	57.3±4.3	23.45±4.35	45.35±11.45	12/52
Control group	64	33/31	56.1±4.2	23.89±5.61	45.67±12.12	18/46
χ^2/t		0.126	1.597	0.496	0.154	1.567
P		0.723	0.112	0.621	0.878	0.211

Table 2. Comparison of ADL between stroke patients before and after treatment ($\bar{x}\pm sd$, score)

Group	Case	Before treatment	After treatment
Control group	64	45.4±5.2	59.2±6.5
Experimental group	64	44.9±5.3	75.5±6.4
t		0.539	14.295
P		0.591	<0.001

Note: ADL, activity of daily living.

Table 3. Comparison of treatment compliance between the two groups (n, %)

Group	Case	Complete compliance	Basic compliance	Non-compliance	Compliance rate
Experimental group	64	29	30	5	87.5%
Control group	64	10	35	19	70.31%
χ^2					10.051
P					0.002

ance: patients took medicine following the doctor's advice, carried out functional recovery training and went to the hospital for a check; basic compliance: the time that patients took medicine and carried out training was less than or equal to 4 times a week, and patients failed to check regularly; non-compliance: the time that patients took medicine and carried out training was less than or equal to twice a week, and patients failed to check regularly.

Questionnaires were used to investigate the satisfaction of patients, including the patient's approval degree of the nursing process, the evaluation of the nurse service attitude and the communication between nurses and patients, etc. The evaluation was divided into 4 levels: satisfaction, relative satisfaction, general satisfaction and dissatisfaction.

Statistical analysis

SPSS 18.0 software was used for statistical analysis. Quantitative data was expressed as ($\bar{x}\pm sd$), and t-test was used for the comparison

between the groups. Qualitative data was expressed as (n, %), and χ^2 test was used for the comparison between the groups. $P<0.05$ was considered as statistically significant difference.

Results

Patients characteristics

There was no difference in gender, age, BMI, course of disease and stroke type between the two groups ($P>0.05$, see **Table 1**).

ADL

Before treatment, the difference in the scores between the control group and the experimental group was not statistically significant ($P=0.591$). After nursing intervention, the Barthel ADL index in the control group was 59.2 ± 6.5 points, which was lower than that in the experimental group 75.5 ± 6.4 points, and the difference between the two groups was statistically significant ($t=14.295$, $P<0.001$). See **Table 2**.

Treatment compliance

There were 29 cases of complete compliance, 30 cases of basic compliance and 5 cases of non-compliance during the follow-up period in the experimental group, with a total compliance rate of 87.5% (59/64); while there were 10 cases of complete compliance, 35 cases of basic compliance and 19 cases of non-compliance in the control group during the follow-up period, with a total compliance rate of 70.31% (45/64). The treatment compliance in the experimental group was higher than that in the control group with statistically significant difference ($P=0.002$). See **Table 3**.

Effect evaluation of continuing care and psychological intervention

Table 4. Comparison of SAS scores of patients' family members between the two groups ($\bar{x} \pm sd$, score)

Group	Case	On the discharge day	Six months after discharge
Control group	64	41.2±7.3	39.6±6.5
Experimental group	64	40.5±7.1	31.1±6.2
t		0.550	7.570
P		0.583	<0.001

Note: SAS, self-rating anxiety scale.

Table 5. Comparison of satisfaction and mortality of stroke patients between the two groups (n, %)

Group	Case	Satisfaction	Mortality
Control group	64	36(56.25)	8(12.5)
Experimental group	64	60(93.75)	1(1.156)
χ^2		24.001	5.856
P		<0.001	0.016

Negative emotion score of family numbers

On the discharge day, there was no statistically significant difference in SAS score between the experimental group and the control group ($P=0.583$). After continuing care and psychological intervention, the SAS score of the family members in the control group was significantly higher than that in the experimental group, and the difference was significant ($P<0.001$). See **Table 4**.

Patients' satisfaction and mortality

Patients' satisfaction and mortality were measured at the end of follow-up period. After continuing care and psychological intervention, the satisfaction of patients in the experimental group was significantly higher than that of patients in the control group ($P<0.001$). There was, however, a significantly higher mortality rate in the control group ($P=0.016$, <0.05). See **Table 5**.

Discussion

With high incidence, disability rate and mortality, stroke seriously affects the daily life of the patients and their families [12]. In recent years, as medical level develops fast, the case fatality rate and disability rate of stroke patients have declined, but most patients survive with hemiplegia and other sequelae, which leads to poor life quality of patients [13, 14]. It is the main

objective to treat the sequelae of cerebral infarction by improving the after-effects and ADL of patients and alleviating the psychological burden of their family members. The paramedics need to carry out effective nursing intervention on the basis of medicinal treatment to control the patient's condition and avoid complications [15].

Continuous psychological nursing referred to a nursing model of psychological assessment and counselling for patients after discharge. This model solved the nursing interruption of patients after discharge to home, and could effectively alleviate the influence of negative emotion of patients and their family members in the later convalescent phase [16]. In this nursing mode, the patients' condition and the mental status of patients and their family members were assessed by professional nursing group. They made targeted preventive plans combined with the education level and personality characteristics of patients and their family members, which was in favor of the elimination and alleviation of negative emotion. Individual psychological counseling for patients' family members could make them fully aware that their positive attitudes, words and deeds were important to establish patient's confidence in recovery. The improvement of the treatment compliance contributed by regular telephone follow-up, timely solutions to the problems encountered by patients and family members during the recovery process, appropriate encouragement and comfort, and enhancement of the patients' confidence.

The results of the study showed that the treatment compliance of the patients after discharge in the experimental group was significantly higher than that in the control group, which suggested that continuing care could improve patients' compliance. Psychological care (telephone, WeChat, door-to-door guidance, etc.) would continue after discharge to make sure that patients could still receive comprehensive nursing services at home, which effectively alleviated patients' negative mental emotion, and enhanced their confidence of treatment; in addition, Barthel ADL index in the experimental group was significantly higher than that in the control group, demonstrating that continuing care could effectively promote patients' recovery.

Effect evaluation of continuing care and psychological intervention

After stroke, active functional recovery training combined with treatment is essential for the improvement of the clinical symptoms and prognosis, however, patients and their family members have different levels of anxiety, depression and other mental disorders, which can easily cause patients unable to cooperate effectively with training and treatment. Continuing care and psychological intervention improved the negative emotion of the family members by boosting the patients' confidence of treatment. Good nurse-patient relationships were established through frequent communications, which was conducive to the development of nursing. Long-term regular recovery training promoted patients' cranial nerve to receive effective physiological stimulation, played a repair role in the residual brain tissues after the disease, and enhanced the flexibility and excitability of nerve activities [17, 18]. Patients were guided to learn relevant knowledge in the family-centered way, and it was beneficial to improve patients' health behaviors. By focusing on training the self-care ability of patients and enhancing ADL in multiple ways, the burden of patients and their families was reduced and the negative emotion of family members was improved [19, 20].

In this study, the satisfaction of patients and their family members in the control group were lower than those in the experimental group. SAS score of family members and the case fatality rate of patients in the control group were higher than those in the experimental group. The difference reached statistically significance ($P < 0.05$), suggesting that continuing care and psychological intervention for stroke patients and their family members were helpful to improve the negative emotion and the satisfaction as well as reduce the patients' case fatality rate.

In conclusion, continuing care and psychological intervention for stroke patients in the convalescent phase have remarkable effects, which can obviously improve the treatment compliance and the ADL of patients and negative emotion of the family members, lighten the economic burden of the society and the mental burden of patients' family members. Nonetheless, there are many factors affecting continuing care and psychological intervention. The later research should accurately eliminate the interference factors, further obtain more effect evaluation of continuing care and psy-

chological intervention in the convalescent phase of stroke.

Disclosure of conflict of interest

None.

Address correspondence to: Yimiao Gong, Department of Clinical Psychology, Teachers College of Columbia University, New York City 10027, United States of America. Tel: 929-2087915; Fax: 929-2087915; E-mail: gongyimiao746@163.com

References

- [1] Zhang DQ, Zeng WJ and Xiong D. Influences of psychological intervention on rehabilitation compliance and effect of patients with post-stroke depression. *Medical Journal of West China* 2014; 26: 757-759.
- [2] Chen SP. Influences of continuous nursing on life quality in stroke patients. *J Med Theor & Prac* 2014; 27: 127-129.
- [3] Mozaffarian D, Benjamin EJ, Go AS, Arnett DK, Blaha MJ, Cushman M, de Ferranti S, Despres JP, Fullerton HJ, Howard VJ, Huffman MD, Judd SE, Kissela BM, Lackland DT, Lichtman JH, Lisabeth LD, Liu S, Mackey RH, Matchar DB, McGuire DK, Mohler ER 3rd, Moy CS, Muntner P, Mussolino ME, Nasir K, Neumar RW, Nichol G, Palaniappan L, Pandey DK, Reeves MJ, Rodriguez CJ, Sorlie PD, Stein J, Towfighi A, Turan TN, Virani SS, Willey JZ, Woo D, Yeh RW and Turner MB. Heart disease and stroke statistics--2015 update: a report from the American Heart Association. *Circulation* 2015; 131: e29-322.
- [4] Cao HQ. Effect of community family nursing on post-stroke depression. *Health World* 2013; 264-265.
- [5] Han XY, Yan WY, Yang HY, Liu ZM and Su QZ. Effect of psychological intervention on intervention in stroke patients with depression and anxiety and its effect on treatment compliance depression and anxiety patients. *Chinese Journal of Gerontology* 2016; 36: 412-414.
- [6] Wang LC. Intervention of comfort pattern application on depression and daily living ability in patients with stroke sequela. *Lab Med Clin* 2014; 11: 2179-2181.
- [7] Ma ZH. Impact of continual nursing intervention on quality of life of patients with stroke. *Journal of Clinical Medicine in Practice* 2013; 17: 161-163.
- [8] Ma Y. Effect of high quality nursing mode on neurological function in patients with cerebral embolism. *Cardiovascular Disease Journal of Integrated Traditional Chinese and Western Medicine* 2015; 3: 155-157.

Effect evaluation of continuing care and psychological intervention

- [9] Wang X and Hong L. Effect of continuing psychological nursing on negative emotions in patients with stroke sequela. *The Journal of Practical Medicine* 2016; 32: 1352-1355.
- [10] Duffy L, Gajree S, Langhorne P, Stott DJ and Quinn TJ. Reliability (inter-rater agreement) of the barthel index for assessment of stroke survivors: systematic review and meta-analysis. *Stroke* 2013; 44: 462-468.
- [11] Ma HZ. The application of psychology combined with language rehabilitation of stroke patients with language and mental disorder. *Cardiovascular Disease Journal of integrated traditional Chinese and Western Medicine* 2016; 14: 1279-1281.
- [12] Yang JM, Pan CY, Ye AS and Nie XF. Effect of continuing nursing on quality of life and mental status of stroke patients. *Journal of Modern Nursing* 2016; 22: 1430-1433.
- [13] Sun YC. Effects of psychological intervention on negative emotion of caregivers of long-term bedridden patients with stroke. *Chinese Journal of Rehabilitation* 2014; 29: 250-252.
- [14] Quah JL, Yap S, Cheah SO, Ng YY, Goh ES, Doctor N, Leong BS, Tiah L, Chia MY and Ong ME. Knowledge of signs and symptoms of heart attack and stroke among singapore residents. *Biomed Res Int* 2014; 2014: 572425.
- [15] Zang XY. Application effect of community rehabilitation nursing in patients with stroke sequela. *International Journal of Nursing* 2015; 34: 1173-1174.
- [16] Gache K, Leleu H, Nitenberg G, Woimant F, Ferrua M and Minvielle E. Main barriers to effective implementation of stroke care pathways in france: a qualitative study. *BMC Health Serv Res* 2014; 14: 95.
- [17] Fens M, van Heugten CM, Beusmans G, Metsemakers J, Kester A and Limburg M. Effect of a stroke-specific follow-up care model on the quality of life of stroke patients and caregivers: a controlled trial. *J Rehabil Med* 2014; 46: 7-15.
- [18] Yang H and Tang S. Exploration of continuity of care of stroke patients after discharging from hospital in Shanxi province. *Chinese Nursing Research* 2016; 30: 1084-1086.
- [19] Lin LM, Mai XW, Chen CF, Zhang HY and Ceng JY. Curative effect of continue rehabilitation nursing guide for recovery of brain function in patients with cerebral infarction. *Chinese Nursing Research* 2013; 27: 2122-2124.
- [20] Bakken LN, Kim HS, Finset A and Lerdal A. Subjective sleep quality in relation to objective sleep estimates: comparison, gender differences and changes between the acute phase and the six-month follow-up after stroke. *J Adv Nurs* 2014; 70: 639-650.