Am J Transl Res 2021;13(7):8021-8030
www.ajtr.org /ISSN:1943-8141/AJTR0131653

Original Article

Analysis of the application of "psycho-cardiology" model in nursing care of acute stroke patients with depression

Juan Wei[1*], Xiangyuan Chen[1*], Chunyan Wen[1], Jingjie Huang[1], Weijun Fang[1], Xiaohua Yang[1], Huijuan Chen[1], Chun Liang[1], Ying Tang[1], Lingxiao Wang[2]

Departments of [1]Neurology, [2]Nursing, Zhujiang Hospital of Southern Medical University, Guangzhou, Guangdong Province, China. [*]Equal contributors and co-first authors.

Received February 8, 2021; Accepted March 28, 2021; Epub July 15, 2021; Published July 30, 2021

Abstract: Objective: To evaluate the effect of "psycho-cardiology" model in nursing care of acute stroke patients with depression. Methods: Seventy-eight acute stroke patients with depression were selected for this prospective study, and they were divided into two groups according to the random number table method. The control group (n=39) were given usual care, and the study group (n=39) were given nursing intervention of "psycho-cardiology" model in addition to usual care. The changes of mental state (Hamilton Depression Scale, HAMD; Hamilton Anxiety Scale, HAMA), the neurological function (National Institute of Health Stroke scale, NIHSS), and the cognitive function (Mini-Mental State Examination, MMSE), the prognostic indicator (Fugl-Meyer Assessment, FMA; Barthel Index, BI) were compared between the two groups before and after the intervention. The incidence of complications and nursing satisfaction were also compared between the two groups. Results: After nursing, the scores of HAMA and HAMD in the study group were significantly lower than those in the control group (P<0.05). The NIHSS score of the study group was significantly lower than that of the control group (P<0.05). The score of MMSE in the study group was significantly higher than that of the control group (P<0.05). The scores of FMA and BI in the study group were significantly higher than those of the control group (P<0.05). There was no significant difference in the incidence of complications between the two groups (P>0.05). The nursing satisfaction of the study group was significantly higher than that of the control group (P<0.05). Conclusion: Nursing intervention of "psycho-cardiology" model for acute stroke patients with depression can effectively alleviate the mental stress of patients, improve neurological function and cognitive function, reduce the occurrence of complications, improve prognosis and nursing satisfaction.

Keywords: Stroke, depression, anxiety, cognitive function, neurological function, motor function, activity of daily living

Introduction

Cardio-cerebrovascular disease is one of the most common and serious diseases endangering human health, with a high fatality rate and disability rate. Even if some patients are treated successfully, there will be still 70%-80% chance of getting disability, which includes varying degrees of consciousness disorder, facial paralysis, limb weakness and so on [1, 2]. Post-stroke depression is a common complication of stroke, which is mainly characterized by pessimism, depression, retardation of thinking, lack of initiative, loss of interest and so on [3]. After depression, it will not only affect the psychological environment of patients, but also affect the recovery of neurological function and decrease their quality of life [4]. Some foreign scholars used the MMSE scale to evaluate the cognitive function of stroke patients and found that the incidence of cognitive impairment could reach 24%-39% 3 months after stroke [5, 6]. Accompanied with the cognitive declination, patients will experience a series of mental health problems such as obvious decreased social skills, happiness, and hope level. It will directly damage the nervous system relating to emotions, cause neurological deficits in the patients, and then alleviate the ability of self-care, aggravate the development of the disease [7]. It was also found that the more severe the degree of hemiplegia in patients with stroke is, the more likely they are to have cognitive impairment, and with the aggravation of the

degree of hemiplegia. The cognitive impairment is aggravated gradually. It can also further aggravate the status of limb disability in patients [8]. Therefore, comprehensive evaluation of patients’ cognitive function and depression, and taking targeted prevention and treatment measures are important to improve the prognosis.

“Psycho-cardiology”, also known as behavioral cardiology or psychological cardiology is the science that studies emotional, social behavior, and environmental problems relating to heart disease. It is necessary and appropriate to identify and intervene with the mental and psychological problems of interfering diseases, and to emphasize the mental health of patients [9]. Many studies have pointed out that on the basis of conventional drug treatment, the implementation of different psychological intervention for patients can not only promote the rehabilitation of patients with basic diseases, but also improve their prognosis, and the quality of life [10]. However, it can be seen from the “psycho-cardiology” that this model is mostly used for the intervention of heart-related cardiovascular diseases, and does not involve the field of stroke disease, while depression, anxiety and other psychological diseases have some commonalities in all kinds of diseases. Based on above, this study will evaluate the application value of “psycho-cardiology” in stroke-related depression. In order to provide theoretical basis for clinical nursing.

Materials and methods

Baseline data

Seventy-eight acute stroke patients with depression admitted in our hospital from December 2019 to July 2020 were selected as a prospective study. They were randomly divided into two groups according to the random number table method, the control group (n=39) was given routine nursing, and the study group (n=39) were given nursing intervention of “psycho-cardiology” mode on the basis of the control group. This study has been approved by the Medical Ethics Committee of our hospital.

Selection criteria

Inclusion criteria: (1) All patients met the diagnostic criteria of stroke in *Guidelines for diagnosis and treatment of acute ischemic stroke in China 2018*, and they were diagnosed by MRI and CT [11]. (2) All patients met the diagnostic criteria of depression in *ICD-10 Classification of Mental and Behavioral Disorders* [12]. (Patients have an education level of elementary school or above, their normal communication is barrier-free, and they can complete the in-study scale evaluation by themselves or with the help of professionals). (3) The score of Hamilton Depression Scale (HAMD) scale was ≥8, and the score of Hamilton Anxiety Scale (HAMA) scale was ≥7. (4) The patients and their families have signed the informed consent form for the study.

Exclusion criteria: (1) Deaf-mute patients with severe arrhythmia, myocardial infarction, heart failure and coronary heart disease. (2) Patients with severe hepatic and renal inadequacy. (3) Patients with brain tumor. (4) Patients who died during the study. (5) Patients who have been committing suicide intentionally during the study. (6) Patients with drug or alcohol dependence and psychoactive substance abuse. (7) Patients with comorbidities such as schizophrenia, bipolar disorder and other severe mental disorders.

Methods

All patients were given conventional stroke treatment after hospitalization, such as Aspirin enteric-coated tablets (Bayer Healthcare Co., Ltd., China; Specification: 100 mg) once a day, orally. Clopidogrel (Lepu Pharmaceutical Co., Ltd., China; Specification: 75 mg) once a day, orally. Atorvastatin calcium (Beijing Jialin Pharmaceutical Co., Ltd., China; Specification: 10 mg) once a day orally. On this basis, nursing intervention was given.

Control group

Routine nursing was given to this group. Health education was carried out to all the patients after admission, with diet control and drugs distribution on time. Patients were guided to carry out some joint activities with the functional training of standing balance etc., such as regular turn-over, flexion, rotation of torso, handshake training, lower limb bypass exercise, sit-up training, bridge exercise training, swallowing training, language training and so on. Patients should be communicated more frequently to

understand their psychological state. More support and encouragement should be given to them to enhance their confidence in early recovery. Their needs should be met as much as possible. Previous cases with good prognosis should be explain to them with positive psychological cues to help them to get rid of the psychological burden.

Study group

The study group were given the nursing intervention of “psycho-cardiology” mode on the basis of the control group. (1) Psychotherapy: The methods such as listening, companionship and patient encouragement were often used to communicate with patients. At the same time, psychoanalysis therapy, that is, transference, empathy, free association and other methods were used to analyze the patient’s unconscious psychological process. And the patient’s current relationship, mental state and behavior patterns were understood through these unconscious factors. Through the exploration of the life history of patients, we can understand how patients experience life development and changes, so as to provide help for patients to better cope with the present and future life. (2) Behavior therapy: By introducing the clinical characteristics, pathogenesis, treatment points and prognosis of stroke, patients were aided to establish a healthy and correct concept of disease knowledge, and to understand the significance of quitting smoking, drinking, reasonable diet and moderate exercise on the prognosis of the disease, so as to change unhealthy behaviors and correct bad habits. It was suggested that patients should be given more companionship and communication in their lives by their family members, avoiding being alone as much as possible. (3) Exercise effect: Some achievable exercises under the guidance of doctors, such as lying in bed, lifting paralyzed limbs for internal rotation, external rotation, adduction, abduction, extension, stretching and so on should be performed on patients during the hospitalization. Balance training such as rising, sitting, standing and walking should be performed on patients, standing with the aid of a walker. Sitting training by holding the armrest of the seat with both hands and slowly lowering the body should be performed to the patients. The patients were walked with the aid of a walker and trained to practice climbing and climbing. (4) Relaxation therapy: A quiet ward environment was kept, and some music were chosen to play in the ward according to the patient’s psychological mood. If the patient’s mood fluctuates a lot and was easily nervous and excited, some soothing light music were chosen to purify the soul. If the patients were depressed or anxious, some cheerful and more interesting music, or some comedy video on TV in the ward were chosen to play. Patients were guided to relax, devote themselves to music or video, and imagine the beauty of nature based the music. After the music was played for a period of time, the patients could be fully relaxed with their muscles. The patients’ wrist was hold by the nursing staffs with their hand to bend the forearm and stretches to form a confrontation, making the patient feel muscle tension and then relax. Then the lower limb and facial muscles were performed with system muscle group relaxation. After relaxing, the patients were guided to lightly close their eyes, and tough to perform deep breathing training, with the left hand putting on the front chest and the right hand on the upper abdomen to relax the abdominal muscles. The abdomen was protruded by slowly inhale through the nose, and then exhale through the mouth. Nursing care was carried out until the patient was discharged. After discharge, the patients were suggested to adhere to the above exercises at home.

Outcome measures

Main outcomes: (1) Mental state: The HAMD and HAMA were used for evaluation before and after nursing [13, 14]. The HAMD scale includes 24 items, such as depression, suicide and guilt, among which 14 items use a 0-4 grade scoring method, and 10 items use a 0-2 grade scoring method. With the scores <8 points as normal, 8-20 points as possible depression, 21-35 points as positive depression, >35 points as severe depression. The HAMA scale included 14 items such as anxiety, tension, insomnia and cognitive function, using a 0-4 grade scoring method. With the scores <7 points as normal, 7-13 points as possible anxiety, 14-20 points as positive anxiety, 21-29 points as obvious anxiety, >29 points as severe anxiety.

(2) Neurological function: The neurological deficit of National Institute of Health Stroke scale (NIHSS) was used to evaluate the patients

before and after nursing [15]. The scale contains 10 items of consciousness, facial paralysis, sensation, gaze, language, dysarthria, neglect, upper and lower limb movement, and limb ataxia. The total score is 42 points, 0-1 points indicate normal or close to normal; 2-4 points indicate mild neurological dysfunction, 5-15 points indicate moderate neurological dysfunction; 16-20 points indicate moderately severe neurological dysfunction; A score of >20 indicates severe neurological impairment. The higher the score, the more severe the neurological impairment.

(3) Cognitive function: The Mini-Mental State Examination scale (MMSE) was used to evaluate the patients before and after nursing. The scale is divided into five items of sense of orientation (up to 10 points), memory (up to 3 points), attention and computing ability (up to 5 points), language ability (up to 9 points) and reading comprehension (up to 3 points). The full score is 30 points, 27-30 points indicate normal cognitive function, 21-26 points indicate mild cognitive dysfunction, 10-20 points indicate moderate cognitive dysfunction, and ≤9 points indicate severe cognitive dysfunction. The higher the cognitive ability, the better the cognitive ability.

(4) Limb motor function: The Fugl-Meyer Assessment scale (FMA) was used to evaluate the patients before and after nursing [16]. The scale includes 17 items such as extensor synergy, flexor synergy and coordination ability. Each item has a score of 0-2, with a total score of 34. The higher the score, the better the lower limb exercise ability.

(5) Ability of daily living: The modified Barthel index scale (BI) was used to evaluate the patients before and after nursing [17]. The scale is divided into ten items of eating, grooming, bathing, dressing, toilet use, stool control, urination control, walking, transfer, and stairs up and down. he activities of daily living are divided into three grades: good, medium and poor, with a full score of 100. A score of >60 points as good, indicating that daily life is basically normal; A score of 40-60 points as moderate, indicating that the patient’s life is slightly dependent on others, with mild dysfunction; A score of <40 points indicating that the patient’s life dependence is strong or completely dependent.

Secondary outcomes: (1) Complications: Other complications during nursing were recorded, such as cerebral edema, increased intracranial pressure, epilepsy, hemorrhagic transformation after cerebral infarction, dystrophia, etc. The incidence of complications = the total number of complications/the total number of cases ×100%.

(2) Nursing satisfaction: Statistics of patients’ satisfaction with nursing service after the end of nursing work. The self-made satisfaction questionnaire was used, including nursing content, nursing skills, communication skills, nursing attitude, etc. A 0-4 grade scoring method was used with the full score was 100, ≥90 point as very satisfied, 80-89 points as satisfied, 70-79 points as general, 60-69 points as dissatisfied, <60 points as very dissatisfied. Satisfaction = (very satisfied + satisfied)/n ×100%. The content validity index of each item of the scale is 0.82-1.00, the average content validity index of all items is 0.93, and the split-half reliability of the questionnaire is 0.972. The questionnaire has good reliability and validity.

Statistical methods

SPSS 22.0 software was used for statistical analysis. The measurement data in accordance with the normal distribution were expressed as ($\bar{x} \pm sd$). Independent sample t test and paired t test were used for intergroup and intragroup comparisons, respectively. The numeration data were expressed by the number of cases and percentage (n, %), and χ^2 test was used. The rank sum test was used for ranked data. The difference is statistically significant when $P<0.05$.

Results

Baseline data

There was no significant difference in the baseline data such as gender, age, course of stroke, type of stroke and underlying diseases between the two groups ($P>0.05$). It can be seen that the research is comparable. The details were shown in **Table 1**.

Mental state

Before nursing, there was no significant difference in HAMA and HAMD scores between the

Table 1. Comparison of baseline data between the two groups ($\bar{x}$ ± sd, n)

Group	Control group (n=39)	Study group (n=39)	t/χ^2	P
Gender (male/female)	18/21	16/23	0.209	0.648
Age (years)	68.3±6.7	67.8±6.2	0.342	0.733
Course of stroke (years)	4.9±1.2	4.6±1.1	1.151	0.253
Type of stroke			0.212	0.645
Cerebral infarction	24	22		
Cerebral hemorrhage	15	17		
Underlying diseases			0.512	0.774
Diabetes	15	12		
Hypertension	20	21		
Hyperlipemia	12	14		

Table 2. Comparison of mental state between the two groups ($\bar{x}$ ± sd, points)

Group	HAMA		HAMD	
	Before nursing	After nursing	Before nursing	After nursing
Control group (n=39)	24.29±3.51	8.74±1.31***	26.31±3.84	8.63±1.29***
Study group (n=39)	23.87±3.38	6.53±1.04***	25.74±3.69	6.35±1.01***
t	0.538	8.251	0.668	8.691
P	0.592	<0.001	0.506	<0.001

Note: Compared with this group before nursing, ***P<0.001. HDMA: Hamilton Depression Scale; HAMA: Hamilton Anxiety Scale.

Table 3. Comparison of NIHSS scores between the two groups ($\bar{x}$ ± sd, points)

Group	Before nursing	After nursing	t	P
Control group (n=39)	11.58±2.49	4.48±1.03	16.455	<0.001
Study group (n=39)	10.74±2.02	3.07±0.76	22.194	<0.001
t	1.636	6.879		
P	0.106	<0.001		

Note: NIHSS: National Institute of Health Stroke scale.

two groups (P>0.05). After nursing, the scores of HAMA and HAMD in the two groups decreased significantly, and the score in the study group was significantly lower than that in the control group (P<0.05). The details were shown in **Table 2**.

Neurological function

Before nursing, there was no significant difference in NIHSS score between the two groups (P>0.05). After nursing, the NIHSS score of the two groups were decreased, and the score of the study group was lower than that of the control group, and the difference was statistically significant (P<0.05). The details were shown in **Table 3**.

Cognitive function

Before nursing, there was no significant difference in MMSE score between the two groups (P>0.05). After nursing, the MMSE score of the two groups increased significantly, and the score of the study group was significantly higher than that of the control group, and the difference was statistically significant (P<0.05). The details were shown in **Tables 4**, **5** and **Figure 1**.

Prognostic indicators

Before nursing, there was no significant difference in FMA and BI scores between the two groups (P>0.05). After nursing, the scores of FMA and BI in the two groups increased significantly, and the scores in the study group were significantly higher than those in the control group (P<0.05). The details were shown in **Table 6** and **Figure 2**.

Table 4. Comparison of MMSE scores in sense of orientation, memory, and attention and computing ability between the two groups ($\bar{x}$ ± sd, points)

Group	Control group (n=39)	Study group (n=39)	t	P
Sense of orientation				
Before nursing	3.62±0.82	3.69±0.87	0.366	0.715
After nursing	6.66±1.39***	7.72±1.74***	2.972	0.004
Memory				
Before nursing	1.04±0.38	1.00±0.42	0.441	0.660
After nursing	1.53±0.52***	2.05±0.77***	3.495	0.001
Attention and computing ability				
Before nursing	2.14±0.52	2.26±0.54	1.000	0.321
After nursing	3.21±0.78***	4.08±0.91***	4.533	<0.001

Note: Compared with this group before nursing, ***P<0.001. MMSE: Mini-Mental State Examination.

Table 5. Comparison of MMSE scores in sense of language ability, reading comprehension, and total score between the two groups ($\bar{x}$ ± sd, points)

Group	Control group (n=39)	Study group (n=39)	t	P
Language ability				
Before nursing	4.01±0.90	4.09±0.91	0.390	0.697
After nursing	6.76±1.39***	7.71±1.84***	2.573	0.012
Reading comprehension				
Before nursing	0.75±0.14	0.81±0.19	1.588	0.117
After nursing	1.53±0.32***	2.05±0.43***	6.059	<0.001
Total score				
Before nursing	11.55±2.62	11.88±2.66	0.552	0.583
After nursing	21.69±3.04***	25.38±4.27***	4.396	<0.001

Note: Compared with this group before nursing, ***P<0.001. MMSE: Mini-Mental State Examination.

Complications

The incidence of complications in the study group was slightly lower than that in the study group, but there was no significant difference between the two groups (P>0.05). The details were shown in **Table 7**.

Satisfaction

The nursing satisfaction of the study group was higher than that of the control group, and the difference was statistically significant (P<0.05). It can be seen that the nursing model of “psycho-cardiology” is more likely to be recognized as nursing services by patients. The details were shown in **Table 8**.

Discussion

Persistent anxiety and pain will promote the occurrence and development of cardiovascular and cerebrovascular diseases through various pathways. The biological pathways of comorbidities involved in stroke and mental disorders include persistent sympathetic activity, parasympathetic inhibition and other autonomic nerve dysfunction. It may also enhance platelet aggregation in cerebral vessels, vascular inflammatory endothelial dysfunction, abnormal regulation of stress response in hypothalamus-pituitary-adrenal axis and so on [18, 19]. Stroke patients are at high-risk of depression. As most of these patients are elderly people, the performance of depression is not typical, such as persistent fatigue, insomnia, lack of interest, slow thinking, reduced activities and so on, which are easy to be ignored, resulting in the deterioration of the disease.

After stroke, patients usually feel terrified by the disease and worry about the financial pressure. This series of negative emotions will increase cortisol, blood pressure, blood lipids and other indicators, leading to a linear increase of morbidity and mortality [20]. In addition, the patient’s heavy depression will cause sympathetic excitement, increase the secretion of hormones such as catecholamines and epinephrine. Such molecules will lead to disorder in the regulation of blood lipid metabolism to release angiotensin, and weaken the arterial dilatation response, as well as cerebral ischemia and hypoxia, which in turn aggravates the condition of stroke [21]. Therefore, when carrying out nursing work for stroke patients, in addition to monitoring medications, daily diet, etc., we must also pay more attention to the chang-

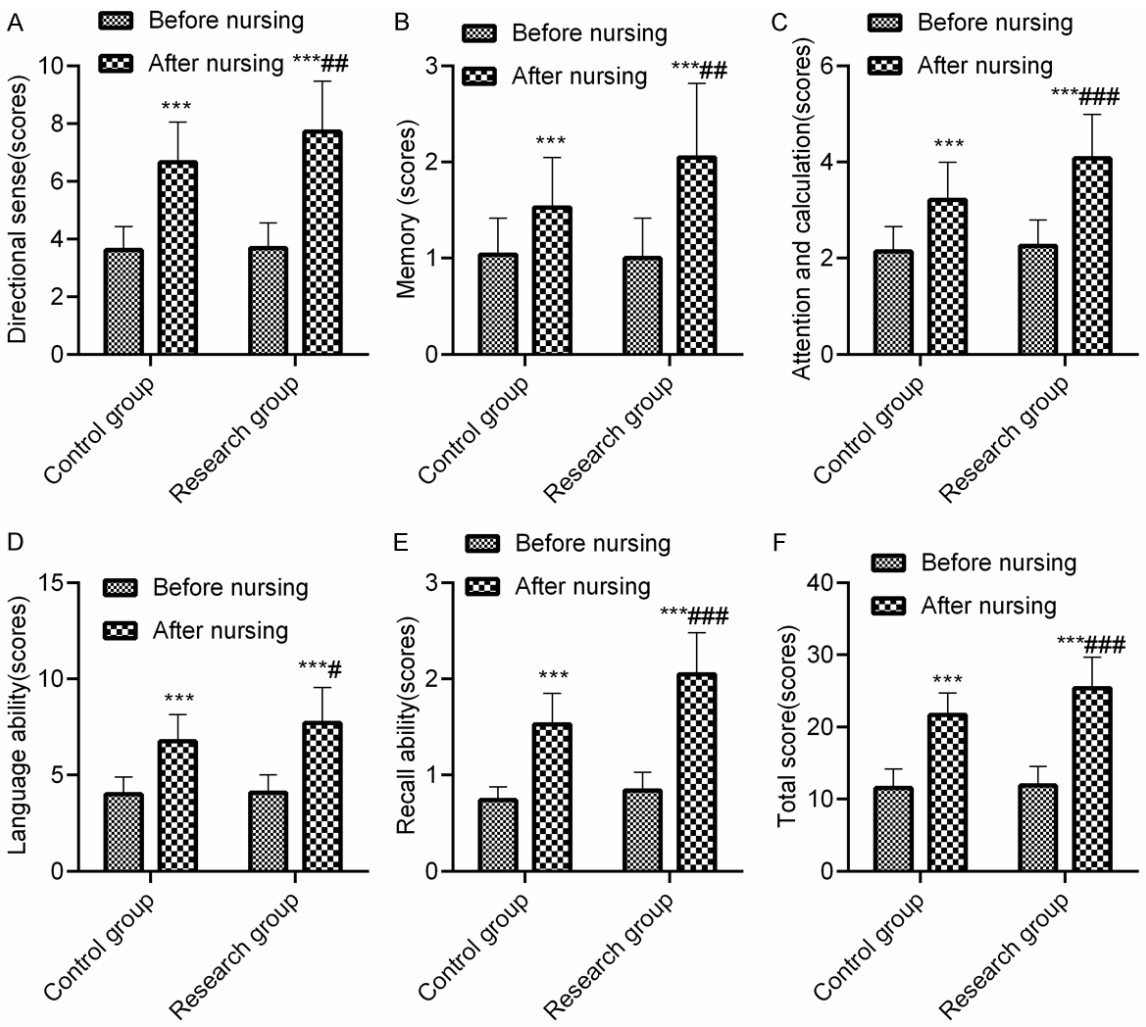

Figure 1. Comparison of MMSE scores between the two groups. A: The scores of the sense of orientation; B: The scores of memory; C: The scores of attention and calculation ability; D: The scores of language ability; E: The scores of reading comprehension; F: Total score. Compared with this group before nursing, ***P<0.001; Compared with the control group after nursing, #P<0.05, ##P<0.01, ###P<0.001. MMSE: Mini-Mental State Examination.

Table 6. Comparison of FMA and Barthel scores between the two groups ($\bar{x}$ ± sd, points)

Group	FMA		Barthel	
	Before nursing	After nursing	Before nursing	After nursing
Control group (n=39)	16.51±2.22	23.96±3.69***	44.24±5.44	65.63±8.32***
Study group (n=39)	15.79±2.04	27.72±4.14***	45.84±5.89	74.35±9.87***
t	1.491	4.234	1.246	4.219
P	0.140	<0.001	0.217	<0.001

Note: Compared with this group before nursing, ***P<0.001. FMA: Fugl-Meyer Assessment.

es in the patients’ mental state, the negative effects of psychosocial factors on patients, and take timely prevention and treatment measures, to maximize the psychological environment of patients and to improve the prognosis. The results of this study showed that after nursing, the scores of HAMA, HAMD and NIHSS in the study group were lower than those in the control group, while the score of MMSE in the study group was higher.This suggested that the model of “psycho-cardiology” can improve patients’ negative emotions, such as depres-

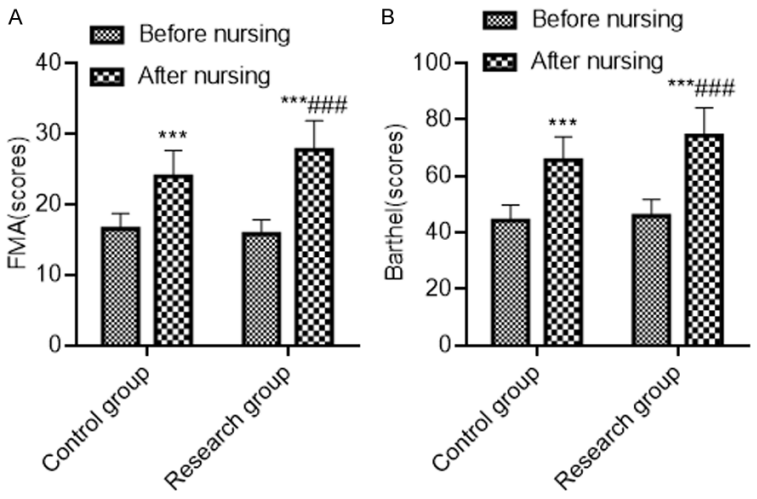

Figure 2. Comparison of FMA and Barthel scores between the two groups. A: FMA score; B: Barthel score. Compared with this group before nursing, ***P<0.001; Compared with the control group after nursing, ###P<0.001. FMA: Fugl-Meyer Assessment; Barthel: activity of daily living.

sion and anxiety, improve their cognitive function and promote the recovery of neurological function. It has been pointed out that in the treatment of patients with chronic heart failure, the “psycho-cardiology” model can achieve the cardiovascular and psychological “diplocardia” treatment effect, with reduction of the depression scale (PHQ-9) score, and improvement of the heart function classification of patients [22]. However, at present, there is no “psycho-cardiology” that was applied to the nursing research of stroke diseases. From the results of this study, it can be seen that this model also has a high application value in the field of stroke, and has a considerable effect on improving patients’ depressive symptoms.

Mental stress is recognized as a risk factor for cardiovascular and cerebrovascular diseases. It is extremely important for cardiovascular and cerebrovascular health to help patients improve their ability to deal with mental stress effectively [23]. The purpose of “psycho-cardiology” is not only to simply put mental illness and heart disease into one unit for treatment, but also to pay more attention to patients’ mental and psychological state while paying attention to patients’ physical manifestations. At the same time, respect the subjective feelings of patients, advocate the real sense of health, and the ultimate goal is to improve the prognosis of patients with cardiovascular disease and achieve complete physical and psychological recovery [24]. The treatment of general mental and psychological problems includes drug treatment and non-drug treatment. At present, selective serotonin reuptake inhibitor (SSRIs), selective noradrenalin reuptake inhibitor (SNRIs), norepinephrin-dopamine reuptake inhibitors (NDRIs) and other drugs were recommended in clinical practice. However, because depression is also a subjective disease, in addition to drug treatment, it also need an appropriate amount of psychological intervention. Psychotherapy is used to help patients learn to understand the disease, solve the psychological troubles they face, and reduce depression, anxiety and somatization symptoms similar to stroke attacks, so as to improve patients’ non-adaptive behavior (interpersonal relationship, reconstruction of self-confidence, adaptive ability, etc.) and improve the quality of life.

Nursing staff need to understand the patients’ life, character and social experience, past and present inner conditions, and help patients to deal with psychological problems and improve their lives through appropriate methods. The first step of double heart care is listening, accompany and be patient, to detect the heart knot of the patient in the conversation, and to give persuasion, encouragement, explanation and hint to help the patient understanding stroke, to identify the symptoms of mental and psychological disorders and the severity of the disease. Patients were trained to understand clearly the stage of their illness and the necessity of treatment for stroke-related depression, so as to obtain patients’ full understanding of disease diagnosis and actively cooperate in the treatment. On this basis, combined with exercise rehabilitation therapy, the benefits of exercise in the prevention and treatment of stroke hemiplegia and promoting the rehabilitation of cerebrovascular events have been proved. As a powerful intervention, it can improve the prognosis of stroke patients in the aspects of biology, physiology, behavior, mental psychology and cognition. For stroke patients with depres-

Table 7. Comparison of complications between the two groups (n, %)

Group	Cerebral edema	Intracranial hypertension	Epilepsia	Hemorrhagic transformation after infarction	Dystrophia and so on	Total incidence
Control group (n=39)	1 (2.56)	0 (0.00)	0 (0.00)	1 (2.56)	4 (10.26)	6 (15.38)
Study group (n=39)	0 (0.00)	1 (2.56)	1 (2.56)	0 (0.00)	2 (5.13)	4 (10.26)
χ^2						0.459
P						0.498

Table 8. Comparison of nursing satisfaction between the two groups (n, %)

Group	Very satisfied	Satisfaction	Generally satisfied	Dissatisfied	Very dissatisfied	Total satisfaction
Control group (n=39)	11 (28.21)	19 (48.72)	6 (15.38)	2 (5.13)	1 (2.56)	30 (76.92)
Study group (n=39)	21 (53.85)	16 (41.03)	1 (2.56)	1 (2.56)	0 (0.00)	37 (94.87)
χ^2						5.186
P						0.023

sion, it is beneficial to both the heart and the brain. The results showed that the scores of FMA and BI in the study group were higher than those in the control group, indicating that the “psycho-cardiology” model is beneficial to improve the limb motor function and enhance the activities of daily life of patients. Reasonable exercise can adjust the tension range of the whole vascular system to meet the body’s needs for different levels of blood vessels. It makes the nervous system, hormones and muscles work in harmony, and regulates the stress hormones such as cortisol and adrenaline, so as to obtain a short-term pleasure. At the same time, it promotes the regeneration of nerve cells in the hippocampus of the limbic system and inhibits the brain tissue caused by long-term depression [25]. In addition, patients with long-term depression will cause the optic neuroendocrine system to secrete too much stress hormones, resulting in hormone secretion disorders and excessive energy consumption. Relaxation therapy through conscious muscle relaxation can relax tension, so that patients can achieve a relaxed state of body and mind, thereby alleviating bad emotions, balancing sympathetic and parasympathetic nerve and other autonomic functions, and gradually calming irritability, anxiety, and sadness to improve comfort experience. The results of this study show that there was no significant difference in the incidence of complications between the two groups, indicating that “psycho-cardiology” is safe and reliable, and does not increase the risk of complications. In addition, according to the survey of patients’ nursing satisfaction, it was found that the degree of nursing satisfaction of the study group was much higher than that of the control group, suggesting that the “psycho-cardiology” model can be more easily recognized by patients through the “bio-psycho-social” system one by one. However, it is worth noting that because there is no medical evidence-based support for stroke disease in “psycho-cardiology” at present, this study is limited to a small sample size study, and there is no long-term follow-up of patients, so it is necessary to expand the sample size for further investigation.

In summary, the nursing intervention of “psycho-cardiology” mode for patients with acute stroke and depression can effectively relieve the patient’s mental state, improve neurological function and cognitive function, reduce the incidence of complications, improve prognosis, and increase nursing satisfaction.

Disclosure of conflict of interest

None.

Address correspondence to: Lingxiao Wang, Department of Nursing, Zhujiang Hospital of Southern Medical University, No. 253 Gongye Avenue, Guangzhou 510280, Guangdong Province, China. Tel: +86-13609715049; E-mail: wanglingxiao68-uy@163.com

References

[1] Guzik A and Bushnell C. Stroke epidemiology and risk factor management. Continuum (minneap minn) 2017; 23: 15-39.

[2] Cai W, Mueller C, Li YJ, Shen WD and Stewart R. Post stroke depression and risk of stroke recurrence and mortality: a systematic review and meta-analysis. Ageing Res Rev 2019; 50: 102-109.
[3] Villa RF, Ferrari F and Moretti A. Post-stroke depression: mechanisms and pharmacological treatment. Pharmacol Ther 2018; 184: 131-144.
[4] Das J and G K R. Post stroke depression: the sequelae of cerebral stroke. Neurosci Biobehav Rev 2018; 90: 104-114.
[5] Chander RJ, Lam BYK, Lin X, Ng AYT, Wong APL, Mok VCT and Kandiah N. Development and validation of a risk score (CHANGE) for cognitive impairment after ischemic stroke. Sci Rep 2017; 7: 12441.
[6] Ciesielska N, Sokołowski R, Mazur E, Podhorecka M, Polak-Szabela A and Kędziora-Kornatowska K. Is the montreal cognitive assessment (MoCA) test better suited than the mini-mental state examination (MMSE) in mild cognitive impairment (MCI) detection among people aged over 60? Meta-analysis. Psychiatr Pol 2016; 50: 1039-1052.
[7] Park J, Lee SU and Jung SH. Prediction of post-stroke functional mobility from the initial assessment of cognitive function. NeuroRehabilitation 2017; 41: 169-177.
[8] Boursin P, Paternotte S, Dercy B, Sabben C and Maïer B. Semantics, epidemiology and semiology of stroke. Soins 2018; 63: 24-27.
[9] Yuan JM, Ling LY, Zhang J, Zhang Y and Miao J. Application of “psychocardiacology therapy” in patients with coronary heart disease complicated with mental disease in the community. Syste Med 2017; 2: 40-43.
[10] Hadidi NN, Huna Wagner RL and Lindquist R. Nonpharmacological treatments for post-stroke depression: an integrative review of the literature. Res Gerontol Nurs 2017; 10: 182-195.
[11] Neurology branch of Chinese medical association. guidelines for the diagnosis and treatment of acute ischemic stroke in China 2018. Chin J Neurol 2018; 51: 666-682.
[12] World Health Organization. ICD-10 Classification of Mental and Behavioral Disorders. In: Fan XD, editor. Beijing: People’s Medical Publishing House; 1993
[13] Vaccarino AL, Evans KR, Sills TL and Kalali AH. Symptoms of anxiety in depression: assessment of item performance of the hamilton anxiety rating scale in patients with depression. Depress Anxiety 2008; 25: 1006-1013.
[14] Dunstan DA, Scott N and Todd AK. Screening for anxiety and depression: reassessing the utility of the zung scales. BMC Psychiatry 2017; 17: 329.
[15] Raza SA, Frankel MR and Rangaraju S. Abbreviation of the follow-up nih stroke scale using factor analysis. Cerebrovasc Dis Extra 2017; 7: 120-129.
[16] Lundquist CB and Maribo T. The fugl-meyer assessment of the upper extremity: reliability, responsiveness and validity of the danish version. Disabil Rehabil 2017; 39: 934-939.
[17] Prasad K, Kumar A, Misra S, Yadav AK, Johri S, Sarkar RS, Gorthi SP, Hassan KM, Prabhakar S, Misra UK and Kumar P. Reliability and validity of telephonic barthel index: an experience from multi-centric randomized control study. Acta Neurol Belg 2018; 118: 53-59.
[18] Shi Y, Yang D, Zeng Y and Wu W. Risk factors for post-stroke depression: a meta-analysis. Front Aging Neurosci 2017; 9: 218.
[19] Gao JJ and Chen ZA. Clinical research progress of cerebral apoplexy. MMI Bimonth 2017; 26: 337-339, 342.
[20] Xie HG. Cognitive impairment should be the focus of comprehensive management after-stroke. Chin J Intern Med 2017; 56: 89-91.
[21] Xiong JH, Jiang YQ and Xu GL. Analysis of post-stroke depression and vascular cognitiveimpairment in elderly patients. Med Inform 2018; 31: 98-100.
[22] Yang SF and Zhou XZ. Application of psycho-cardiology medical mode in patients with chronic heart failure and depression. Chin J Urban Rural Enterp Hygien 2019; 34: 4-6.
[23] Rohde D, Williams D, Gaynor E, Bennett K, Dolan E, Callaly E, Large M and Hickey A. Secondary prevention and cognitive function after stroke: a study protocol for a 5-year follow-up of the ASPIRE-S cohort. BMJ Open 2017; 7: e014819.
[24] Liu X, Song S and Yang GP. Application of nursing intervention based on psycho-cardiology model in elderly patients with coronary heart disease and angina pectoris. Nurs Pract Res 2019; 16: 42-44.
[25] Bordet R, Ihl R, Korczyn AD, Lanza G, Jansa J, Hoerr R and Guekht A. Towards the concept of disease-modifier in post-stroke or vascular cognitive impairment: a consensus report. BMC Med 2017; 15: 107.