Journal of Clinical and Nursing Research, 2024, Volume 8, Issue 5
http://ojs.bbwpublisher.com/index.php/JCNR
Online ISSN: 2208-3693
Print ISSN: 2208-3685

Effects of Progressive Muscle Relaxation Training on Anxiety, Depression, and Quality of Life in Patients with Cerebral Small Vessel Disease

Chengwen Shi, Feifan Zhao*, Yingshuo Wang, Chengxuan Liu, Aiyu Mao, Siqi Jin

Peking University People's Hospital, Beijing 100000, China

Corresponding author: Feifan Zhao, Ff15810852511@163.com

Abstract: *Objective:* To explore the effects of progressive muscle relaxation training on anxiety, depression, and quality of life in patients with cerebral small vessel disease (CSVD). *Methods:* Sixty-one patients with CSVD in the Department of Neurology of a tertiary hospital were divided into an observation group (28 patients) and a control group (33 patients) by lottery method. The control group received conventional nursing care, while the observation group received progressive muscle relaxation training interventions in addition to the conventional care. The Hamilton Anxiety Scale (HAMA), the Hamilton Depression Scale (HAMD), and the Stroke-Specific Quality of Life Scale (SS-QOL) were used to compare the effects before the intervention, 7 days after the intervention, and 30 days after the intervention. *Results:* Over time, at different time points after the intervention, the anxiety and depression scores of patients with CSVD in the observation group were significantly lower than those in the control group ($P < 0.05$). The quality of life scores were significantly higher in the observation group compared to the control group ($P < 0.05$), and these differences were statistically significant. *Conclusion:* Progressive muscle relaxation training can improve anxiety and depression in patients with cerebral small vessel disease and can effectively enhance their quality of life.

Keywords: Progressive muscle relaxation training; Cerebral small vessel disease (CSVD); Anxiety; Depression; Quality of life

Online publication: June 24, 2024

1. Introduction

Cerebral small vessel disease (CSVD) has been increasing in recent years due to the accelerated aging of society. Patients with CSVD clinically present with stroke, cognitive impairment, and affective disorders [1]. About 20% of strokes [2] and 45% of dementia cases [3] are reported to be caused by CSVD. Additionally, CSVD increases the risk of stroke by three times and dementia by two times, posing a serious threat to the life and health of patients [4,5]. Among the emotional disorders, the incidence of anxiety and depression in CSVD patients is high, with a prevalence between 40% and 60% [2]. Related studies show that anxiety and depression in CSVD patients are mainly manifested as nervousness, irritability, fatigue, loss of appetite, weight loss, and

sleep disorders [6]. Long-term negative emotions not only affect the recovery of the patient's condition but also bring significant economic, psychological, and social burdens to the patients and their families [7-9]. Anxiety and depression in CSVD patients are serious complications of cerebrovascular disease, significantly affecting recovery and quality of life [10], and even increasing the rates of death, disability, and cognitive dysfunction [11]. Progressive muscle relaxation training (PMRT) involves the conscious sequence of tensing and relaxing the whole body muscles [12], allowing the patient to experience active relaxation, reduce stress levels, alleviate negative emotions, and improve physiological function. This training method has been successfully applied to pregnant women [13], post-surgery patients [14], tumor patients [15], and chronic disease patients [16], but its applicability to CSVD patients needs further verification. Therefore, this study applied progressive muscle relaxation training to CSVD patients, aiming to reduce anxiety and depression and improve their quality of life.

2. Materials and methods

2.1. General information

Sixty-one patients with CSVD in the Department of Neurology of a tertiary-level hospital were selected from October 2021 to May 2022 as the study subjects, and they were grouped using the lottery method, including 28 cases in the observation group and 33 cases in the control group. The study was approved by the Ethics Committee of the hospital. Inclusion criteria: (1) Meet the diagnostic criteria of the "2015 Chinese Consensus on the Diagnosis and Treatment of Cerebral Small Vessel Disease" [17]; (2) HAMA ≥ 7 points [18] or HAMD > 7 points [19]; (3) Age 18–80 years old; (4) Consciousness is clear and able to understand the questionnaire; (5) Patient signed the informed consent form. Exclusion criteria: (1) Patients with speech, writing, vision, and hearing impairments; (2) Concurrent major organ disorders; (3) Severe mental disorders; (4) Hospitalization days less than 7 days.

2.2. Methods

2.2.1. Control group

Routine nursing measures were adopted.

(1) Condition observation: Closely monitor the patient's vital signs and dynamic changes in their condition, and promptly report any adverse reactions to the doctor.

(2) Skin care: Instruct or assist patients in maintaining skin cleanliness and hygiene.

(3) Dietary care: Provide dietary guidance, advising patients to consume a light diet with moderate amounts of various fruits and vegetables, and to avoid fried, spicy, and stimulating foods.

(4) Psychological nursing: Inform patients that long-term negative emotions can affect treatment outcomes by altering hormone levels in the body. Encourage patients to relax, adjust their mindset, and build confidence in their treatment.

(5) Medication nursing: Monitor the efficacy and adverse reactions of medications used.

(6) Health promotion: Provide safety guidance, including fall prevention and disease-related knowledge promotion. Advise patients to keep a chaperone, be accompanied by family members when leaving the bed, and not leave the hospital without permission.

(7) Discharge care: Assist patients with discharge procedures, remind them to take medications as prescribed, schedule regular check-ups at home, and guide them to join the WeChat health management group.

(8) Post-discharge telephone follow-up: Conduct monthly telephone follow-ups with discharged patients to understand their physical recovery, medication adherence, sleep, and psychological status, and provide

health education and guidance.

2.2.2. Observation group

Progressive muscle relaxation training was carried out in addition to routine care. The progressive muscle relaxation training tutorial (published by the Chinese Medical Association Audiovisual Press) was uploaded to the patients' mobile phones, including both inpatient intervention and home individual intervention.

2.2.2.1. Inpatient intervention

The intervention started on the second day of the patient's admission, usually performed before bedtime. PMRT was conducted once a day for 25–30 minutes each session. After the first inpatient progressive relaxation therapy session, the patient was added to a WeChat group that included a chief nurse practitioner, a nurse practitioner, a neurologist, a psychologist, a researcher, and the intervention patient. The specific steps of progressive muscle relaxation training (**Figure 1**) are as follows:

(1) Pre-relaxation preparation: (a) Environmental preparation: Ensure a quiet environment with appropriate lighting and temperature; (b) Patient preparation: Explain the purpose of progressive muscle relaxation, the basic process, the time required, and precautions. Ask the patient to empty their bladder and bowels; (c) Relaxation pose: The patient should lie down with feet apart and arms by their sides, finding the most comfortable posture.

(2) Pre-relaxation training: Instruct the patient to take a deep breath, tighten the hand muscles for 10–15 seconds, and then relax them for 10–15 seconds to experience the sensations of muscle tension and relaxation.

(3) Conducting relaxation training: (a) Measure the baseline pulse of the patient; (b) Instruct the patient to exclude distractions and concentrate before starting formal relaxation training; (c) Follow the PMRT tutorial stored on the mobile phone, starting with the relaxation of the hands. The sequence includes forearms, upper arms, shoulders, neck, chest, thighs, calves, etc. Each muscle group should be practiced twice, with a total duration of 25–30 minutes; (d) Ensure coordination of muscle tension and relaxation for each group, emphasizing the feeling of relaxation; (e) Basic PMRT action: Instruct the patient to notice the tension in their muscles, maintain the tension for 10 seconds, and remember the sensation. Then, relax for 5–10 seconds and experience the relaxation of each muscle group.

(4) Post-relaxation: (a) Measure the patient's pulse after relaxation; (b) Encourage patients to actively express their feelings about the training process to ensure effective PMRT implementation and facilitate timely guidance from the researcher.

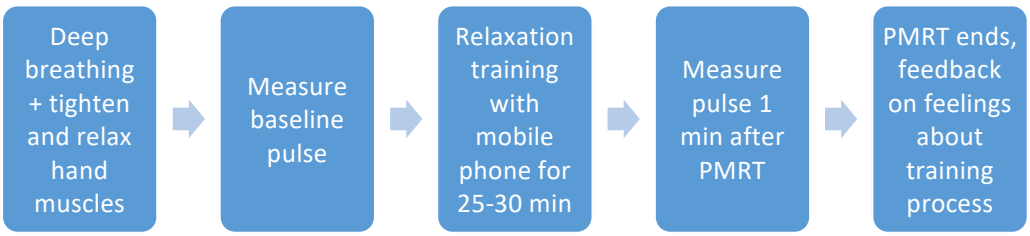

Figure 1. Progressive muscle relaxation training process

Judgment of relaxation success: (1) During the training process, the patient may exhibit eyelid fluttering, eyeball turning, tearing, and slower respiration. If the patient is in the supine position, foot adduction may occur; (2) The pulse rate decreases after relaxation training.

2.2.2.2. Home intervention for patients

After discharge, patients continued PMRT once a day, usually before bedtime, for 25–30 minutes each session to avoid fatigue.

(1) The researcher sent the audio tutorial of progressive muscle relaxation training and its precautions to the WeChat group, with reminders for training at a fixed time every night.

(2) The observation group received a paper version of the progressive muscle relaxation training guide to train at home. The materials included diary forms instructing patients to record their training diary, which included the training date and any issues that arose during training. These records were uploaded via WeChat and fed back to the researcher.

Anxiety, depression, and quality of life scores were recorded by the researchers on the 30th day after the intervention.

2.3. Observational indicators

(1) The Hamilton Anxiety Scale (HAMA) [18] was used to evaluate the patients' anxiety. Compiled by Hamilton in 1959, the scale has good reliability and validity (reliability coefficient *r* is 0.93 for the total score, 0.83–1.00 for each single factor, and 0.36 for the validity coefficient). The HAMA contains 14 items and is the most widely used scale in clinical practice to assess anxiety. It is divided into two categories: psychogenic anxiety (6 items) and somatic anxiety (7 items). The scale is assessed by a professional physician and takes about 10–15 minutes each time. The main statistical indicators for HAMA are the total score and factor scores. The total score reflects the severity of the condition, while factor scores represent the characteristics of the patient's specific symptom group. All factors are scored on a 5-point scale (0–4 points), with higher scores indicating more severe anxiety. According to the criteria, a total score > 29 indicates severe anxiety, 22–29 indicates significant anxiety, 15–21 indicates definite anxiety, 7–14 indicates possible anxiety, and a score < 7 indicates no anxiety.

(2) The Hamilton Depression Scale (HAMD) [19] was used to evaluate the patients' depression. Compiled by Hamilton in 1960, the scale has good reliability and validity (reliability coefficient *r* for the total score is 0.88–0.99). The HAMD contains 17 items and is the most widely used scale in clinical practice for assessing depression. The scale is assessed by a medical professional and takes about 20 minutes each time, with some factors requiring assistance from family members and other medical personnel. The HAMD score is divided into a total score and factor scores, with the total score reflecting the severity of the participant's depressive state and the factor score reflecting the characteristics of the participant's depressive symptom clusters. Most factors are rated on a 5-point scale (0–4 points), while a few factors are rated on a 3-point scale (0–2 points). Higher scores indicate more severe depression. HAMD scores of < 7 indicate normal; scores of 7–17 indicate mild depression; scores of 18–24 indicate moderate depression; and scores of > 24 indicate severe depression.

(3) The Stroke-Specific Quality of Life Scale (SS-QOL) was used to evaluate the patient's quality of life. Compiled by Williams *et al*., the scale consists of 49 items across 12 dimensions, with a total score ranging from 49 to 245. Higher scores indicate a better quality of life. The Chinese translation of the scale was tested for reliability and validity by Wang *et al*. [20], confirming its good reliability and validity in mild-to-moderate stroke patients. It is now widely used in stroke patients.

2.4. Statistical analysis

Data were statistically analyzed using SPSS 26.0 software. Count data were expressed as [*n* (%)] and tested by the chi-squared test, while measurement data were expressed as mean ± standard deviation (SD), tested by

either the *t*-test for data that are normally distributed or the Wilcoxon rank-sum test for non-normally distributed data. *P*-values of less than 0.05 were considered statistically significant differences.

3. Results

3.1. General information of patients in the two groups

In the control group, there were 18 males and 15 females, aged 44–75 years, with an average of 63.70 ± 9.00 years; in the observation group, there were 11 males and 17 females, aged 44–75 years, with an average of 60.29 ± 11.05 years. The difference between the general information of patients in the two groups was not statistically significant ($P > 0.05$) and was comparable, as shown in **Table 1**.

Table 1. Comparison of general information of patients in two groups

	Observation group ($n = 28$)	Control group ($n = 33$)	c^2	*P*
Gender				
Male	11	18	1.414	0.234
Female	17	15		
Age (years)				
≤ 44	3	1	4.032	0.258
45–59	11	8		
60–74	12	22		
≥ 75	2	2		
BMI (kg/m^2)				
< 18.5	0	1	3.398	0.334
18.5–23.9	10	13		
24–27.9	13	9		
≥ 28	5	10		
Residence				
Urban	16	26	3.312	0.191
Rural	7	4		
Township	5	3		
Education level				
Junior high school and below	17	14	3.101	0.212
High school or junior college	6	14		
College or bachelor's degree	5	5		
Religious				
No	24	30	0.401a	0.527a
Yes	4	3		
Marital status				
Married	26	28	1.340	0.512
Other	2	5		

Table 1 (Continued)

	Observation group (n = 28)	Control group (n = 33)	c^2	P
Payment methods				
Medical insurance	15	23		
New agricultural cooperative	12	8	5.109	0.164
Others	1	2		
Household income				
Balance of income and expenditure	1	4	0.555a	0.456a
Balance of income over expenditure	27	29		
Type of CSVD				
Cerebral cavity infarction	23	26	0.108	0.743
Cerebral white matter	5	7		
Number of chronic diseases				
0	3	4		
1–2	22	20	2.847	0.241
> 2	3	9		
Tobacco and alcohol addiction				
None	19	22		
Smoking	2	3	0.614	0.893
Alcohol	3	2		
Smoking and drinking	4	6		
Types of care				
Kinship care	22	24		
Nanny or carer	6	4	5.111	0.078
Others	0	5		
Tests related to relaxation therapy				
No	25	29	0.30	0.864
Yes	3	4		

3.2. Comparison of HAMA, HAMD, and SS-QOL in two groups of patients

The repeated measures ANOVA of anxiety, depression, and quality of life for the two groups of patients with cerebral small vessel disease are shown in **Tables 2** and **3**. As seen in **Table 2**, the differences in the time effect, between-group effect, and interaction effect of HAMA and HAMD between the two groups of patients were significant ($P < 0.05$). In **Table 3**, the differences in the time effect and between-group effect of SS-QOL between the two groups of patients were significant ($P < 0.05$), while the interaction effect was not significant ($P > 0.05$).

Table 2. Comparison of anxiety and depression scores between the two groups before intervention (Day 0), after 7 days of intervention (Day 7), and after 30 days of intervention (Day 30) (mean ± SD; points)

Group	HAMA			HAMD		
	Day 0	Day 7	Day 30	Day 0	Day 7	Day 30
Observation group (n = 28)	25.11 ± 3.19	21.61 ± 3.45	16.75 ± 3.42	21.71 ± 5.84	17.86 ± 5.05	13.61 ± 4.31
Control group (n = 33)	26.97 ± 4.45	24.36 ± 3.75	21.88 ± 3.82	24.24 ± 5.00	22.12 ± 4.49	19.61 ± 4.49
F intergroup / P intergroup	12.670 / 0.001			12.225 / 0.001		
F time / P time	236.645 / < 0.001			228.202 / < 0.001		
F interaction / P time	17.779 / < 0.001			17.806 / < 0.001		

Table 3. Comparison of quality of life scores between the two groups before intervention (Day 0), after 7 days of intervention (Day 7), and after 30 days of intervention (Day 30) (mean ± SD; points)

Group	Day 0	Day 7	Day 30	Time effect F (P)	Between-group effect F (P)	Interaction effect F (P)
Observation group (n = 28)	174.18 ± 16.65	184.50 ± 14.43	197.18 ± 14.17	420.528 (< 0.001)	5.805 (0.019)	61.959 (0.681)
Control group (n = 33)	169.67 ± 21.58	174.03 ± 18.71	179.70 ± 18.40			

4. Discussion

4.1. Gradual muscle relaxation training can improve the anxiety and depression of patients with cerebral small vessel disease

After experiencing the disease, patients with cerebral small vessel disease tend to be depressed due to changes in work status, worries about disease recurrence, and anxiety over long-term recovery [21], leading to the persistent accumulation and gradual internalization of adverse emotions. According to foreign literature, the prevalence of comorbid anxiety and/or depression in patients with cerebral small vessel disease ranges from 10.1% to 60% [22,23], varying with statistical methods and patient characteristics. For the Chinese population, Gao *et al*. [24] assessed 60 patients with new-onset cerebral small vessel disease using the Hamilton Depression Scale and the Anxiety Scale and found that 55% of the patients had comorbid depression, 28.3% had comorbid anxiety, and 21.7% had both comorbid depression and anxiety. The results of this study showed that at different times after the intervention, the anxiety and depression scores of patients in both groups decreased compared with the pre-intervention period, and the difference in the scores of the observation group was statistically significant (F anxiety between groups = 12.670, $P < 0.05$; F depression between groups = 12.225, $P < 0.05$), indicating that progressive muscle relaxation training can effectively improve the anxiety and depression in patients with cerebral small vessel disease. The reasons are analyzed as follows: progressive muscle relaxation training involves voluntary tension and relaxation of 60 groups of muscles from hands to feet, which can divert the attention of patients and help stabilize their emotions [25]. Through the cyclic alternating muscle relaxation pattern of "contraction-relaxation-contraction again," individuals are trained to acquire and execute the tension and relaxation of each muscle group, control the degree of muscle tension, maintain relaxation, and achieve the effects of anxiety relief and depression inhibition [26].

4.2. Progressive muscle relaxation training improves quality of life in cerebral small vessel disease

In the previous study [27] as well as this study, it was found that some natural recovery occurs in about 38% of patients after a stroke. The control group's quality of life improved after 6 weeks, probably due to the natural recovery from the plasticity and functional reorganization of the central nervous system, as well as the results of the intervention in which hospitalized patients received routine care. The results of this study showed that at different times after the intervention, the quality of life scores for cerebral small vessel disease increased in both groups compared with the pre-intervention period, and the difference in the scores of the observation group was statistically significant (F quality of life between groups = 5.805, $P < 0.05$), indicating that progressive muscle relaxation training can effectively improve the quality of life of patients with cerebral small vessel disease. By using the training method of first tensing and then relaxing the muscles, total relaxation is achieved. This method helps patients understand the rehabilitation process, learn to express their negative emotions, and achieve psychological relief, thereby improving their quality of life by learning to control the tension of each muscle group in the whole body.

5. Conclusion

Progressive muscle relaxation training can divert part of the attention of patients with cerebral small vessel disease, help stabilize emotions, improve anxiety and depression, and enhance the quality of life. By training individuals to master their emotions and perform tension and relaxation activities for different muscle groups, patients can learn to independently manage the tension of various muscle groups and maintain psychological calmness. This process ultimately reduces negative emotions such as uneasiness and depression and improves the individual's quality of life. However, the sample size of this study is small, and a multi-center, large-sample study is recommended to explore the superiority of progressive muscle relaxation training in improving the mental health of patients with cerebral small vessel disease in the future.

Disclosure statement

The authors declare no conflict of interest.

References

[1] Skrobot OA, Black SE, Chen C, et al., 2018, Progress Toward Standardized Diagnosis of Vascular Cognitive Impairment: Guidelines from the Vascular Impairment of Cognition Classification Consensus Study. Alzheimers Dement, 14(3): 280–292. https://doi.org/10.1016/j.jalz.2017.09.007

[2] Li H, Wang X, 2016, Neuroimaging Manifestations of Cerebral Small Vessel Disease and Mood-Affective Disorder Clinical Study. Health Career Education, 34(7): 144–146.

[3] Gorelick PB, Scuteri A, Black SE, et al., 2011, Vascular Contributions to Cognitive Impairment and Dementia: A Statement for Healthcare Professionals from the American Heart Association/American Stroke Association. Stroke, 42(9): 2672–2713. https://doi.org/10.1161/STR.0b013e3182299496

[4] Jiang JG, Yang CQ, Xu ZQ, et al., 2018, Progress in the Pathogenesis of Cerebral Small Vessel Disease. International Journal of Cerebrovascular Disease, 26(8): 628–631.

[5] Wu X, Zhou H, Li L, 2019, Investigation Study and Treatment of Anxiety and Depression After Cerebral Small Vessel Lesion. Heilongjiang Medicine, 32(2): 275–277.

[6] Kong X, Wang Y, Wang X, et al., 2017, Analysis of Cognitive Function Impairment Characteristics and Risk Factors in Patients with Different Types of Cerebral Small Vessel Disease. Chinese General Medicine, 20(5): 543–548.

[7] Liang Y, 2017, Research on the Effect of Psychological Nursing Intervention on Anxiety and Depression Co-Morbidity (PSCAD) in Young Ischaemic Stroke Patients. Psychologist, 23(15): 231–231.

[8] Zhao L, Yang Z, Wang L, 2019, Study on Risk Factors Associated with Cerebral Small Vessel Disease Causing Cognitive Dysfunction. Chinese Journal of Clinicians, 47(5): 564–567.

[9] Ma W-Q, Nie Z-H, Mu X, et al., 2016, Investigation and Research on Mental Health Status and Influencing Factors of Patients with Cerebral Small Vessel Disease. Zhejiang Journal of Integrative Chinese and Western Medicine, 26(9): 860–861.

[10] Di ZH, Qin XY, Wang PF, et al., 2017, Clinical Study of Donepezil Hydrochloride Combined with Ginkgo Biloba in the Treatment of Mild Cognitive Dysfunction in the Elderly. Journal of Liaoning University of Traditional Chinese Medicine, 19(2): 160–162.

[11] Xu S, Hu H, 2016, Treatment and Care of Elderly Acute Stroke Patients Under Multidisciplinary Team Collaborative Management. Chinese Journal of Critical Care Medicine (Electronic Edition), 9(3): 214–216.

[12] Aksu NT, Erdogan A, Ozgur N, et al., 2018, Effects of Progressive Muscle Relaxation Training on Sleep and Quality of Life in Patients with Pulmonary Resection. Sleep Breath, 22(3): 695–702. https://doi.org/10.1007/s11325-017-1614-2

[13] Yang B, Lin W, 2019, Effects of Progressive Muscle Relaxation Training on Psychological State, Compliance and Labor Outcome of Primiparous Women. China Primary Medicine, 26(7): 807–810.

[14] Chang D, Wu W, Hao F, et al., 2018, Effects of Progressive Muscle Relaxation Training on Negative Emotions and Sleep Quality in Patients with Limb Fracture. Journal of Nursing, 33(21): 73–75.

[15] Charalambous A, Giannakopoulou M, Bozas E, et al., 2016, Guided Imagery And Progressive Muscle Relaxation as a Cluster of Symptoms Management Intervention in Patients Receiving Chemotherapy: A Randomized Control Trial. PLoS One, 11(6): e0156911. https://doi.org/10.1371/journal.pone.0156911

[16] Şahin ZA, Dayapoğlu N, 2015, Effect of Progressive Relaxation Exercises on Fatigue and Sleep Quality in Patients with Chronic Obstructive Lung Disease (COPD). Complement Ther Clin Pract, 21(4): 277–281. https://doi.org/10.1016/j.ctcp.2015.10.002

[17] Teng Z, Feng J, 2017, Progress in the Study of Cerebral Small Vessel Disease and Post-Stroke Cognitive Impairment. International Journal of Neurology Neurosurgery, 44(1): 102–105.

[18] Gong J, Wu C, Zhou J, 2016, The Effect of Emotion on Cognitive Function in Patients with Anxiety Disorders. Chinese Journal of Modern Medicine, 26(8): 114–117.

[19] Wang N, Mao P, Li Z, 2017, A Randomized Controlled Study of Cognitive-Behavioral Therapy or Supportive Psychotherapy Combined with Medication for Geriatric Depression. Chinese Journal of Psychiatry, 50(5): 371–376.

[20] Wang Y, Ma J, Li J, et al., 2003, A Preliminary Study on the Reliability and Validity and Sensitivity of the Chinese Translation of the Quality of Survival Scale for Stroke. Chinese Journal of Geriatric Cardiovascular and Cerebrovascular Diseases, 2003(6): 391–394.

[21] Song M, Feng D, Su J, 2007, Clinical Analysis of Post-Stroke Psychological Disorders. Chinese Journal of Health Psychology, 15(5): 440–441.

[22] van Sloten TT, Sigurdsson S, van Buchem MA, et al., 2015, Cerebral Small Vessel Disease and Association with Higher Incidence of Depressive Symptoms in a General Elderly Population: The AGES-Reykjavik Study. Am J Psychiatry, 172(6): 570–578. https://doi.org/10.1176/appi.ajp.2014.14050578

[23] Rensma SP, van Sloten TT, Launer LJ, et al., 2018, Cerebral Small Vessel Disease and Risk of Incident Stroke, Dementia and Depression, and All-Cause Mortality: A Systematic Review and Meta-Analysis. Neurosci Biobehav

Rev, 90: 164–173. https://doi.org/10.1016/j.neubiorev.2018.04.003

[24] Gao P, Zhai L, An W, 2018, Measurement of Cognitive, Emotional and Daily Living Abilities in Patients with Cerebral Small Vessel Disease. Chinese Journal of Health Psychology, 26(10): 1544–1547.

[25] Zhang R, Xu Q, Chu YX, et al., 2019, The Effect of Touch Therapy Combined with Progressive Muscle Relaxation Training on Reducing Perioperative Stress Response in Gastric Cancer Patients. Chinese Journal of Modern Nursing, 25(22): 2815–2819.

[26] Zhang C, Yang J, Kang X, 2020, Application Effect of Positive Stress Reduction Combined with Progressive Muscle Relaxation Training in Patients with Anxiety During the Outbreak of Cancer Pain. Practical Clinical Medicine, 21(9): 66–69.

[27] Xiao M, 2012, Research on the Impact of Group Intervention Program on the Quality of Life of Community Stroke Patients, thesis, Jilin University.