

Application Effect of Five Elements Music Therapy Based on Biological Time Node Analysis in the Clinical Nursing of Patients with Post-stroke Depression

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Keywords

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Abstract

Objective To explore the application effect of the five elements music therapy based on biological time node in the clinical nursing of patients with post-stroke depression (PSD). **Methods** A total of 110 patients with PSD admitted to our hospital from January 2018 to August 2020 were selected and divided into the control and study groups according to the random number table, with 55 cases in each group. The control group was given routine nursing, and the study group was given five elements music therapy based on biological time node on the basis of the control group. The depression symptoms, sleep quality, coping mode, neurological function, cognitive function and self-care ability in the two groups were compared. **Results** After treatment, the Beck depression inventory (BDI), Hamilton depression scale (HAMD), Pittsburgh sleep quality index (PSQI), China stroke scale (CSS), and yield scores in the two groups were evidently lower than those before treatment ($P < 0.05$), and the scores in the study group were evidently lower than those in the control group ($P < 0.05$); after treatment, the mini mental state examination (MMSE), Barthel index (BI), face and avoidance scores were evidently higher than those before treatment ($P < 0.05$), and the scores in the study group were evidently higher than those in the control group ($P < 0.05$). **Conclusion** The five elements music therapy based on biological time node had a good application effect in the clinical nursing of PSD patients, which could alleviate depression, promote cognitive and neurological recovery, improve sleep quality and self-care ability as well as the patients' medicine coping level.



Introduction

Post-stroke depression (PSD) refers to the most common psychological disease after stroke, and it is often clinically manifested as depression, eating deficiency disorder. What's worse, some patients presents with pessimistic and even suicidal psychology, which is not conducive to the neurological functional rehabilitation of patients and seriously affects their quality of survival [1]. Previous rehabilitation treatment for PSD was mainly psychological intervention, but the treatment was not targeted and interfered by external factors, resulting in poor efficacy. Therefore, novel therapies still need to be continuously explored in the clinic to improve the clinical efficacy of PSD and the quality of life of PSD patients. It has been shown [2] that the nursing method based on biological time node can make use of the correlation between the biological rhythm of human body and the development of disease, and carry out targeted psychological and physiological nursing for patients according to different time points, which is of great significance in alleviating patients' bad emotions. In addition, music can affect people's psychological and physiological activities through different rhythms and melodies, and at the same time, it can intervene and treat clinical diseases, and has the effect of treating both the mind and the body [3]. The five elements music therapy is a kind of therapy that combines the five internal organs and five emotions of the human body with the five elements to treat diseases. It is widely used in patients with insomnia and anxiety, and has good curative effect [4]. At

present, there are few researches on the five elements music therapy based on biological time node in PSD treatment, therefore, this study aims to explore the application effect of five elements music therapy based on biological time node on PSD, and the research report is as follows.

Materials and methods

General data

A total of 110 PSD patients treated in our hospital from January 2018 to August 2020 were selected, which were divided into the control and study groups according to the random number table method, 55 cases in each group. There were no significant differences in gender, age, type and disease duration between the two groups ($P>0.05$) and they were comparable, as detailed in Table 1. This study was approved by the ethics committee of the hospital, and all patients gave written informed consent. Inclusion criteria: in accordance with the diagnostic criteria of stroke in *All kinds of cerebrovascular diseases and diagnostic points* [5], and in accordance with the diagnostic criteria of depression in *Chinese classification and diagnostic criteria of mental disorders* [6]; stable vital signs; normal hearing. Exclusion criteria: patients with severe dysfunction of heart, liver and kidney; patients with previous use of psychotherapy drugs or history of mental illness; patients with consciousness disorder; patients who did not like music or were allergic to music; patients who did not cooperate; patients with aphasia.

Table 1 Comparison of general data between the two groups

Group	Cases	Gender (cases)		Age (years)	Type (cases)		Disease duration (months)
		Male	Female		Cerebral infarction	Cerebral hemorrhage	
Study group	55	30	25	62.85±7.53	32	23	4.26±1.34
Control group	55	33	22	63.74±6.85	35	20	4.50±1.42
χ^2/t		0.334		-0.648	0.344		-0.912
P		0.563		0.518	0.558		0.364

Treatment

Control group

The control group was given routine nursing, mainly including routine treatment and related nursing measures. Routine treatment includes the control of blood pressure, blood glucose and lipid, neural resuscitation, anti-platelet aggregation and other measures. Nursing measures: patients were given admission guidance, discharge guidance and daily life and diet care, and PSD related knowledge was introduced to patients. During the whole nursing period, nurses often communicated with patients to relieve patients' bad emotions. The treatment cycle was 4 weeks.

Study group

On the basis of the control group, the study group was added with five elements music therapy based on biological time node. The main operations were as follows: ① selection of biological time nodes, 9:00~11:00, 16:00~17:00, 19:00~21:00 were selected as the optimal time points of care, which can maximally stimulate patients to be positive and optimistic. During the periods of 9:00~11:00, 16:00~17:00, 19:00~21:00, targeted psychological nursing measures were taken by experienced nurses trained in professional psychological nursing, and the patients were correctly guided to recognize the PSD disease; during the period of 19:00~21:00, five elements music was selected for therapeutic nursing of patients. ② The selection of five elements music was based on the principle of traditional Chinese medicine (TCM) syndrome differentiation. For patients with deficiency of heart and spleen, the Gong mode music such as *Colorful clouds chasing the moon*, *Empty space mountain bird twitter* and *Night of spring flowers, river, and moon* were selected, together with the Zhi mode music such as *Fisherman's song at dusk* and *Ambush on all sides* to achieve the effect of invigorating spleen and nourishing blood; for patients with liver Qi stagnation, the Jue mode music such as *The agreeable spring breeze*, *Zhuang zhou dreaming a butterfly* and *Journey to Gusu* were selected, and combined with uteri regulated music to achieve the

effect of soothing liver and relieving depression; for the patients with liver depression and spleen deficiency, the music of Jue mode and Gong mode was selected to achieve the effect of soothing liver and invigorating spleen; for the patients with kidney essence deficiency, combined with the Zhi mode music, the Yu mode music, such as *The Moon Over a Fountain* and *Plum-blossom in three movements*, were selected to achieve the effect of stabilizing Qi; for the patients with lung Qi deficiency, the Shang mode music, such as *Pathetique* and *The Spring Snow*, were selected to achieve the effect of nourishing Yin and tonifying lung. ③ Specific nursing measures: 9:00~11:00, 16:00~17:00 periods: a. health knowledge publicity and education, the nurses introduced the causes, treatment methods of PSD disease as well as the uses and effect of self-healing therapy to patients and their families in various forms such as videos and books, and the TCM syndrome differentiation theory of five elements music was told to deepen patients' understanding of the disease and five elements music, and to relieve the fear and anxiety of patients to the disease; b. during the period of nursing, nurses should listen to patients patiently, pay attention to patients' bad emotions and timely relieve and comfort, which helps to establish good relationship between nurses and patients, promote patients to obtain enough sense of safety and improve patients' enthusiasm for treatment; c. the relevant concepts of coping modes, such as face and avoidance, were introduced to patients by nurses, and the patients were also made aware of the correct coping modes of PSD to improve the level of medical coping of patients; d. during the nursing process, nurses guided the happy memories between patients and their families by encouraging family members to actively provide emotional support, so as to enhance the positive emotions of patients; e. by sharing the experience of similar patients with good prognosis, patients' self-confidence in treatment and rehabilitation can be improved. 19:00~21:00 period: the nurses guided the patients to wear earphones, adjusted the volume until the patient is comfortable, guided the patients to actively feel the music melody

and start meditation, 30 min/time, once a day, and the treatment cycle is 4 weeks.

Outcome measures

Depression symptoms and sleep quality

Before and after treatment, Beck depression inventory (BDI) and Hamilton depression scale (HAMD) were used to evaluate the depression symptoms of the two groups [7], ① BDI included 21 items, and the scoring criteria were: BDI score≤10, no depression; 10<BDI score≤ 15, mild emotional distress; 15<BDI score≤25, depression; BDI score>25, severe depression; ② HAMD included 17 items, the scoring criteria were: HAMD score≤7, no depression; 7<HAMD score≤17, possible depression; 17< HAMD score≤ 24, depression; HAMD score> 24, severe depression.

Sleep quality

Before and after treatment, Pittsburgh sleep quality index (PSQI) [8] was used to evaluate the sleep quality of the two groups, including seven items of time to fall asleep, sleep disturbance, hypnotic drugs, and so on, with a total score of 21 points. The higher the score, the worse the sleep quality.

Coping modes

Before and after treatment, the medical coping mode questionnaire [9] was used to evaluate the coping modes of patients, including three dimensions: face, avoidance and yield, with 20 items in each dimension. The score range of each item was 0~4. The higher the score of the dimension, the more times the coping mode of the dimension was applied.

Neurological, cognitive function and self-care

ability

Before and after treatment, the neurological, cognitive function and self-care ability of patients in both groups were evaluated [10, 11]. ① The China stroke scale (CSS) was used to assess the degree of neurological impairment of patients in both groups, with a total score of 45 points, with higher scores indicating more severe neurological impairment; ② the mini mental state examination (MMSE) was used to assess cognitive function in both groups, with a total score of 30 points, with higher scores indicating better cognitive function; ③ the Barthel index (BI) was used to assess the two group patients' self-care ability, the total score was 100 points, and a higher score indicated a stronger self-care ability in daily life.

Statistical analysis

SPSS 20.0 was used for statistical analysis, and the count data were compared using the χ^2 test, and the measurement data were expressed as the mean \pm standard deviation ($\bar{x}\pm s$), and the comparison was performed using the *t* test, with *P*<0.05 considered statistically significant.

Results

Comparison of BDI, HAMD and PSQI scores between the two groups

Before treatment, there were no significant difference between the two groups in BDI, HAMD and PSQI scores (*P*>0.05); after treatment, the BDI, HAMD and PSQI scores in the two groups were significantly lower than those before treatment (*P*<0.05), and the scores in the study group were significantly lower than those in the control group (*P*<0.05), see Table 2.

Table 2 Comparison of BDI, HAMD and PSQI scores between the two groups (points)

Group	Cases	BDI		HAMD		PSQI	
		Before treatment	After treatment	Before treatment	After treatment	Before treatment	After treatment
Study group	55	18.74±3.12	12.34±3.15*	22.34±3.14	13.74±2.95*	16.74±3.15	8.46±2.23*
Control group	55	18.23±2.75	15.22±3.77*	21.75±3.85	16.58±3.74*	17.37±4.01	10.77±2.85*

<i>t</i>	0.909	-4.348	0.881	-4.422	-0.916	-4.734
<i>P</i>	0.365	0.000	0.380	0.000	0.362	0.000

Note: compared with before treatment: **P*<0.05.

Comparison of coping modes between two groups
 Before treatment, there was no significant difference between the two groups in the face, avoidance, and yield scores (*P*>0.05); after treatment, the face, avoidance scores in the two groups were significantly higher than those before treatment (*P*<0.05), and the scores in the study group were significantly higher

than those in the control group (*P*<0.05); after treatment, the yield score in the two groups was significantly lower than that before treatment (*P*<0.05), and the score in the study group was significantly lower than that in the control group (*P*<0.05), see Table 3.

Table 3 Comparison of coping modes between two groups (points)

Group	Cases	Face		Avoidance		Yield	
		Before treatment	After treatment	Before treatment	After treatment	Before treatment	After treatment
Study group	55	15.74±3.52	25.74±4.76*	12.28±2.88	15.44±3.14*	13.34±3.15	7.46±2.05*
Control group	55	16.22±3.73	21.38±5.12*	11.74±3.25	14.05±3.22*	12.88±3.64	9.24±3.02*
<i>t</i>		-0.694	4.625	0.922	2.292	0.709	-3.617
<i>P</i>		0.489	0.000	0.358	0.024	0.480	0.000

Note: compared with before treatment: **P*<0.05.

Comparison of CSS, MMSE and BI scores between the two groups
 Before treatment, the CSS, MMSE, and BI scores in the two groups were not significantly different (*P*>0.05); after treatment, the MMSE and BI scores in the two groups were significantly higher than those before treatment (*P*<0.05), and the scores were

significantly increased in the study group compared with those in the control group (*P*<0.05); after treatment, the CSS score in the two groups was significantly lower than that before treatment (*P*<0.05), and the CSS score in the study group was significantly lower than that in the control group (*P*<0.05), as shown in Table 4.

Table 4 Comparison of CSS, MMSE and BI scores between the two groups (points)

Group	Cases	CSS		MMSE		BI	
		Before treatment	After treatment	Before treatment	After treatment	Before treatment	After treatment
Study group	55	28.64±5.36	13.74±3.85*	20.45±4.78	26.62±3.14*	53.16±7.22	70.33±8.24*
Control group	55	27.62±6.34	16.70±4.12*	19.34±5.52	24.38±3.82*	51.88±6.74	65.52±7.79*
<i>t</i>		0.911	-3.893	1.127	3.359	0.961	3.146
<i>P</i>		0.364	0.000	0.262	0.001	0.339	0.002

Note: compared with before treatment: **P*<0.05.

Discussion

In recent years, with the increasing aging population, the incidence of PSD is in a continuous increasing trend, which seriously endangers people's life health [12]. In TCM, PSD belongs to the category of "depression syndrome" and "stroke", and its disease location is in the brain, liver, and spleen, etc. The sentimental discomfort and injured seven emotions lead to the stagnation of liver Qi and obstruction of Qi, forming "depression syndrome"; Qi depression exists from the beginning to the end, and runs through the whole process of the disease. TCM treatment advocates holistic regulation and dialectical treatment, with the basic principles of strengthening spleen and nourishing blood, soothing liver and calming heart, regulating Qi and relieving depression.

In this study, the BDI, HAMD, PSQI, CSS scores and yield scores in the two groups after treatment were significantly lower than those before treatment, and the scores in the study group were significantly lower than those in the control group; the MMSE, BI scores, face and avoidance scores in the two groups after treatment were significantly higher than those before treatment, and the scores in the study group were significantly higher than those in the control group, indicating that the five elements music therapy based on biological time node had the obvious efficacy in the clinical nursing of patients with post-stroke depression, it can effectively relieve the depression symptoms, promote the recovery of neurological and cognitive functions, improve the medical coping level and the ability of daily living of patients, and improve the quality of sleep. According to biologists, in the three time zones of 9:00~11:00, 16:00~17:00 and 19:00~21:00, the human body has high mental activity, can actively cooperate with relevant activities, and is willing to communicate. Therefore, the nursing intervention has better clinical effect in these three zones of 9:00~11:00, 16:00~17:00, 19:00~21:00. In this study, positive psychological intervention was carried out on PSD patients at 9:00~11:00 and 16:00~17:00 time zones, the nurses described disease knowledge, coping mode and TCM syndrome differentiation theory of five elements music in detail

to patients, which not only increased patients' cognition of disease and five elements music, but also reduced patients' fear, anxiety and other negative emotions out of unknown disease. At the same time, nurses encouraged family members to provide emotional support and shared the good prognosis experience of similar cases, which is conducive to the recovery of patients' physical and mental health, the increase of the self-confidence of patients to overcome the disease, and is of great significance to the recovery of patients' cognition and neurological function. In addition, TCM advocates that the heart Qi before the period of the day from 23:00~1:00 needs to be calm, so that the music appreciation performed in 19:00~21:00 time zone has a better efficacy. The five elements music therapy can adjust the viscera and emotion of human body by using the relationship between the five-tone "Jue, Zhi, Gong, Shang, Yu" and the five internal organs (liver, heart, spleen, lung, kidney), and the five emotions (anger, joy, sorrow, anxiety, fear), and then achieve the therapeutic effect. Among the five-tone, the Jue tone belongs to wood, which can enter the liver and gallbladder, its sound is harmonious but not violent, moistening but not withering, and can achieve the effect of soothing the liver and relieving depression and diffusing Qi; the Zhi tone belongs to fire, which enters the heart and small intestine, its sound is irritable and sounds like fire burning, and has the effect of calming the mind and heart, and regulating the blood vessels; the Gong tone belongs to earth, which enters the spleen and stomach, its sound is long and deep, solid and dull, and has the effect of invigorating spleen and nourishing stomach and regulating Qi; the Yu tone belongs to water, which enters the kidney, its sound is light, clear and soft, can achieve the effect of promoting diuresis nourishing Yin, calming heart and reducing fire; the Shang tone belongs to metal, which enters lung and can achieve the effect of nourishing Yin and protecting lung, calming heart and brain. In addition, according to modern research [13], stroke patients have a long course of disease, and their lesions can destroy the emotional regulation pathways of the human body, leading to the decrease of

norepinephrine and 5-hydroxytryptamine content in the body, thus causing depression. According to Xin Qi et al. [14], music therapy can increase the content of norepinephrine and 5-hydroxytryptamine in the brain of depression mice, suggesting that music may regulate central neurotransmitters by increasing the release of serotonin from the central nervous system and promoting the secretion of norepinephrine from hypothalamus, thus exerting utility in treating depression.

In conclusion, the application effect of five elements music therapy based on the biological time node analysis in the clinical nursing of patients with post-stroke depression was good, which could alleviate the symptoms of depression, promote the recovery of cognitive and neurological functions, improve the quality of sleep and self-care ability, and improve the medical coping level of patients.

Acknowledgement

Not applicable.

Conflict of Interest

The authors declare no conflicts of interest.

Author Contributions

Conceptualization, Data curation, C.H.G and Z.Y.P; Formal analysis, L.D.X; Methodology, W.H.Z; Writing-Original draft, C.H.G; Writing-review and editing, Z.L; All authors have read and agreed to the published version of the manuscript.

Ethics Approval and Consent to Participate

The study was approved by the Medical Ethics Committee, and the patients were informed and consented.

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Availability of Data and Materials

The data presented in this study are available on request from the corresponding author.

Supplementary Material

Not applicable.

References

- [1] Weiming Lu. Effect of escitalopram and sertraline on inflammatory factors, NSE and NPY in patients with post-stroke depression [J]. Chinese Journal of General Practice, 2017, 15(8):1340-1341,1401.
- [2] Licheng Zhang, Xiuhuan Qiu. Effect of time point management on the quality of anesthesia recovery in patients undergoing surgery [J]. International Journal of Nursing, 2020, 39(15):2703-2705.
- [3] Xiaoju Zhu, Xiaojun He. Research progress in the treatment of aphasia after stroke by music therapy [J]. Chinese Nursing Research, 2020, 34(2):288-290.
- [4] Qunfang Qu, Yuting Tan, Chuanfang Wu, et al. Research Status of TCM Five Elements Musical Therapy Improving Depression [J]. Western Journal of Traditional Chinese Medicine, 2020, 33(1):155-158.
- [5] National 4th cerebrovascular academic conference of Chinese Medical Association. Key points for the diagnosis of various cerebrovascular diseases [J]. Chinese Journal of Neurology, 1996, 29(6):379.
- [6] Psychiatric branch of Chinese Medical Association. Chinese classification and diagnostic criteria of mental disorders [J]. Chinese Journal of Neurology, 2001, 34(3):184-188.
- [7] Hui Wang, Hui Ma, Kaili Diao, et al. Mediating effect of symptom self-assessment on negative automatic thinking and psychosocial function in patients with clinically cured depression [J]. Chinese Journal of Behavioral Medicine and Brain Science, 2018, 27(12):1091-1095.
- [8] Zhipeng Peng, Xingping Zhang, Junyu Chen, et

al. Study on the comparison of the PSQI difference between“spleen without storing idea”and“kidney without storing willing”types with in insomnia [J]. *Shanghai Journal of Traditional Chinese Medicine*, 2020, 54(4):65-67.

[9] Saisai Liu, Yan Shan, Lin Zhang, et al. Current status of disease adaption in patients with early peritoneal dialysis and analysis of its influencing factors [J]. *Modern Preventive Medicine*, 2017, 44(22):4206-4209.

[10] Shirong Wei, Yujuan Gao, Xiaoyang Wei, et al. Relationship between serum miRNA-20b, miRNA-199a levels and neurological deficit and collateral circulation in patients with acute ischemic stroke [J]. *Guangxi Medical Journal*, 2020, 42(20):2629-2633.

[11] Xuhua Wei. Curative effect of Yishen Chuchan decoction on Parkinson's disease and its influence on motor function, mental state and serum α -Syn, T-AOC and MDA levels [J]. *Journal of Sichuan of Traditional Chinese Medicine*, 2018, 36(7):137-139.

[12] Wang H, Zhang W, Zhao W, et al. The efficacy of transcranial alternating current stimulation for treating post-stroke depression: Study Protocol Clinical Trial (SPIRIT Compliant) [J]. *Medicine*, 2020, 99(16):19671.

[13] Yingdan An, Lingjuan Li. Effects of repetitive transcranial magnetic stimulation on norepinephrine and 5-hydroxytryptamine in post-stroke epilepsy patients with comorbid anxiety and depression [J]. *Chinese Journal of Integrative Medicine on Cardio-Cerebrovascular Disease*, 2018, 16(19):2889-2891.

[14] Xin Qi, Shuang Meng, Wei Wang. The effect of music therapy on the spatial learning and memory ability and neuroimmune inflammatory factors in Alzheimer's disease mice [J]. *Chinese Journal of Gerontology*, 2019, 39(18):4567-4570.