

Effect of Five-Elements Music Therapy Combined With Baduanjin Qigong on Patients With Mild COVID-19

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Abstract

Background: To investigate the physical and psychological effects of five-element music therapy combined with Baduanjin qigong treatment on inpatients with mild coronavirus disease 2019 (COVID-19) in Wuhan. **Methods:** A mixed-methods study was used. In the quantitative study, a randomized controlled trial was performed on 40 study participants divided into a control group ($n = 20$) and an intervention group ($n = 20$). The Self-rating Anxiety Scale, Self-rating Depression Scale and Pittsburgh Sleep Quality Index were compared. For qualitative analysis, it adopted purposive sampling method, 13 patients of different ages from 18 to 60 years old and different exercise behavior were selected as the participants from the intervention group. A semi-structured interview method was used to collect data, and the content analysis method was used for data analysis. An interview outline was developed to assess the psychological condition and personal functional-exercise behavior of patients. **Results:** In the quantitative study, the anxiety self-scores and depression self-scores of patients in intervention group were significantly lower compared with control group after treatment ($p < .05$). The sleep quality of intervention group was significantly improved compared with control group ($p < .001$). Participants in the qualitative study responded to questions posed through semi-structured interviews. The effect of intervention was good, which has been supported and recognized by patients. **Conclusion:** The treatment of five-element music therapy combined with Baduanjin qigong on patients with mild COVID-19 alleviated anxiety and depression, and improved sleep quality, which was beneficial to the patients' physical and psychological recovery.

Keywords

COVID-19, baduanjin, five-element music

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Introduction

In the early stage of COVID-19, cough and fever are the main symptoms, whereas, in the later stage, the lungs are affected, and the condition of severely ill patients deteriorates rapidly. As the pathogen of COVID-19, SARS-CoV-2 is newly occurring in humans, there is no specific clinical treatment for it during that period of time (National Health Commission, 2020). Hence, adjunctive treatments, such as bed rest, antiviral drugs, antibiotics, multiple-organ support,

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as well as breathing, circulation, and strengthening exercises, have been used. At present, the overall number of new cases of COVID-19 in China is stabilizing, but the rapid increase worldwide is alarming (National Health Commission, 2020). Thus, helping the large number of patients with mild symptoms cope with COVID-19 and overcome the epidemic is important.

In response to the diagnosis of COVID-19, some patients have experienced negative emotions, such as panic, anxiety and depression in the early stage of the disease, which seriously affects the subsequent treatment (López-Carral et al., 2020).

Previous research revealed a profound and wide range of psychosocial impacts during infectious outbreaks, at the individual, community, and international levels. On an individual level, people are likely to experience fear of becoming sick or dying themselves, feelings of helplessness, as well as stigma (Hall et al., 2008).

Data from a national sample of 674 Americans with COVID-19 showed that older age, higher levels of mindfulness and social support, and meaning focused coping predicted better adjustment, reflecting resilience, while avoidance coping was particularly unhelpful (Park et al., 2021). In models predicting change over time, approach-oriented coping (i.e., active coping, meaning-focused coping, and seeking social support) was minimally predictive of subsequent adjustment. Given the unique and ongoing circumstances presented by COVID-19, specific interventions targeting psychosocial resources and coping identified here may help to promote resilience as the pandemic continues to unfold (Park et al., 2021). In the absence of specific medications, strengthening self-resistance, relaxing, and maintaining a good psychological state have become important auxiliary measures in treating COVID-19.

Five-elements music therapy (FEMT) is an important psychological therapy in TCM that plays a unique part in regulating negative emotions and restoring physical and mental health. FEMT has been shown to alleviate negative emotions, such as anxiety and depression, in patients with pulmonary heart disease, and has an adjuvant therapeutic effect (Liu et al., 2018). FEMT can greatly improve the clinical treatment of depressed patients, and has the advantages of being cost-effective, having a short treatment course, being safe, and not eliciting adverse reactions (Zhang et al., 2018).

“Baduanjin qigong” (BQ) is an important part of traditional health culture in China. This method incorporates exercise training, breathing-muscle exercise, and psychological rehabilitation in accordance with the basic requirements for pulmonary rehabilitation. BQ supports physical and mental health without further specifiers, which can be used in patients with diabetes mellitus, chronic obstructive pulmonary disease, etc. (Cao et al., 2020; Zou, Yeung et al., 2018). A meta-analysis

showed that BQ and FEMT were beneficial adjuvant therapies in treating patients with other conditions (Zhao et al., 2020). For patients with mild COVID-19 in hospital, FEMT combined with BQ helped patients reduce negative emotions, such as anxiety, and improve their physical condition.

FEMT combined with BQ is widely applied and has, in general, shown a significant effect upon depression (Chan & Tsang, 2019; Chen, Y et al.). Therefore, in the present study, we evaluated the physical and psychological effects of FEMT combined with BQ on inpatients with mild COVID-19 in Wuhan. We speculated that FEMT combined with BQ was beneficial to the patients’ physical and psychological recovery. Furthermore, we used qualitative research to explore the effects of exercise and the feelings of patients after exercise, and further verified the psychological state of anxiety and depression when the patient became sick.

Methods

Study Overview

A mixed-methods study was used, consisting of a quantitative study based on a randomized controlled trial, and qualitative research to obtain information through interviews with study participants. The study was carried out at Chongqing Traditional Chinese medicine hospital from March 2020 to June 2020. Study participants were recruited from inpatients of our hospital.

Ethical Consideration

This study has been approved by the ethics committee of Chongqing Traditional Chinese Medicine Hospital [2021-ky-46], and all participants have signed the informed consent.

Quantitative Research

Procedures

Participants. A convenient sampling method was used to select inpatients of our hospital with mild COVID-19 in March 2020. The inclusion criteria were: (1) clinical diagnosis of COVID-19 according to Chinese Diagnosis and Treatment Protocol for Novel Coronavirus Pneumonia (National Health Commission, 2020); (2) ability to walk independently and participate in physical activities; (3) volunteered to participate in the study; (4) no participation in other forms of physical exercise treatment during participation in our study. The exclusion criteria were: (1) mental illness, and cognitive and behavioral abnormalities confirmed by a psychiatrist; (2) severe physical illness and restricted mobility (e.g., severe heart dysfunction, malignant progressive hypertension, or severe rheumatoid joints in the

lower limbs) or being in the acute exacerbation period of a chronic disease (e.g., chronic heart failure or rheumatism, or suffering from acute complications); (3) withdrawal during the course of treatment. Patients were randomly assigned in a 1:1 ratio to either conventional nursing or conventional nursing plus FEMT combined with BQ with the use of a computerized randomization system.

Treatment in the Experimental Group. Based on conventional nursing, the intervention was carried out using FEMT combined with BQ. Regarding to FEMT, we selected from the five categories including “Gong,” “Shang,” “Jue,” “Zhi,” and “Yu”, which correspond with “Do” “Re” “Mi” “So” “La”, from *Chinese Traditional Five-Element Music (Positive Mode)* published by the Audiovisual Press of the Chinese Medical Association. We used a personal computer to convert the tracks to MP3 format, and used MP3 players, mobile telephones, or other auxiliary devices to play the music. Before treatment, the patient was suggested to empty his/her bowels, and the feasibility, science, and characteristic of FEMT was explained to the patient in easy-to-understand language to obtain his/her understanding and cooperation. FEMT was carried out after meals or before going to bed. During FEMT, the patient rested in the supine position to maintain relaxation of all muscles. The patient listened to music with headphones and the volume was set to 30–40 dB. Treatment was delivered in 30-min sessions, once a day, five times a week.

BQ administration was based on guidelines set by the Health Qigong Management Center of the State General Administration of Sports. Three-dimensional motion guidance was provided to patients, and the efficacy of BQ was explained until they could repeat the movements reliably and proficiently. Patients were given videos of BQ to learn by themselves. Briefly, BQ included eight movement, which were prop up the sky with both hands to regulate the triple warmer; draw a Bow on both sides like shooting a vulture; raise single arm to regulate spleen and stomach; look Back to treat five strains and seven impairments; sway head and buttocks to expel heart-fire; pull toes with both hands to reinforce kidney and waist; clench fists and look with eyes wide open to build up strength and stamina; rise and fall on tiptoes to dispel all disease. Patients practiced by themselves twice a day repeatedly (once in the morning and once in the afternoon) in sessions of about 30 min. One concentrated exercise per week (with supervision and control of the quality of the exercise) was performed in all patients (Supplementary Table 1).

Treatment in the Control Group. In the control group, routine nursing was performed, and patients undertook daily activities and exercises on their own.

Assessments. The Self-rating Anxiety Scale (SAS) (Wang et al., 2020) is a self-rating scale consisting of 20 items used to assess the subjective feelings of anxiety and its changes during treatment. According to the results of Chinese norms, the cutoff value of the standard score of the SAS is 50 points, while “mild anxiety” is 50–59 points, “moderate anxiety” is 60–69 points, and “severe anxiety” is >69 points (Li, H et al., 2016).

The Self-rating Depression Scale (SDS) (Zung, 1965) is a 20-item self-rating scale for assessing the subjective feelings of depression and its changes during treatment. Depression can be determined if the total score is >40 points or the standard score is >60 points. Because of its refined design, simple calculation method, ease of use, and high reliability and validity (Belvederi Murri et al., 2017), it is an internationally recognized self-assessment scale for depression and anxiety.

The Pittsburgh Sleep Quality Index (PSQI) was compiled by the University of Pittsburgh Medical Center (Buysse et al., 1989) and comprises 19 self-assessments and five other assessments. A score of ≤ 7 points indicates “better sleep quality”, and a score of >7 points indicates “sleep disturbance”. The higher the score is, the worse the sleep quality is.

Semi-Structured Interview. A study using a semi-structured interview was carried out. An interview outline was developed to assess the psychological condition and personal functional-exercise behavior of patients. Before the formal interview, two patients were pre-interviewed by the nurses participating in the study and the content was repeated based on the interview results. The outline of the formal interview involved six questions: (1) What is your current understanding of COVID-19? (2) What is your current exercise level? (3) Which factors do you think affect your participation in the exercise? (4) What was your main feeling and experience during the exercise and listening to music? (5) What kinds of difficulties did you encounter during the exercise? (6) What kind of further help is needed?

Qualitative research

Procedures. A quiet interview environment was created to avoid external interference. During the interview, the patient’s written consent was obtained to make a full audio recording to assess his/her body language, tone, and expression. To protect the privacy of interviewees, research results were presented anonymously, and the names were replaced with numbers.

Statistical Analysis. Statistical analysis was carried out using SPSS v23.0 (IBM, Armonk, NY, USA). Measurement data were analyzed by analysis of variance with repeated measurements. If the difference was significant, the *t*-test

Table 1. Basic Characteristics.

Characteristics	Control Group (n = 20)	Intervention Group (n = 20)	p
Age	42.10±8.47	41.30±7.73	0.758
Gender			0.748
Male	13	11	
Female	7	9	
Educational level			0.809
Primary school and below	5	7	
Junior high school	6	4	
High school or technical secondary school	5	6	
Bachelor's degrees or higher	4	3	
Marital status			0.637
Unmarried	2	3	
Married	14	15	
Divorce/widowhood	4	2	

between groups was undertaken. $p < .05$ was considered as significant difference.

For qualitative research, the sample size was determined based on the repeated occurrence of the data of the interviewees. At the end of each interview, the researchers transcribed the audio and text records within 24 h using the double-entry method and by encoding each interview record. The content-analysis method was used to organize and analyze the data. Data analysis by using Colaizzi 7-step analysis method. Two researchers transcribed and collated the original data, and then they coded, classified, and refined the topics independently. Three themes including strong fear of disease, awareness of active exercise and good social-support system were recorded. If opinions differed, the research team reached a consensus to ensure the accuracy of results.

Results

Quantitative Analysis

Basic Characteristics. Totally 40 patients were included. The control group contained 13 males and seven females while the average age was 42.10 ± 8.47 years. The intervention group contained 11 males and nine females, while the average age was 41.30 ± 7.73 years. There was no significant difference between the two groups in terms of basic data, including gender and age ($p > .05$) (Table 1).

Comparison of SAS Score and SDS Score Between Two Groups. There was no significant difference of SAS score and SDS score before the intervention between the two groups. The SAS score and SDS score after intervention of intervention group were significantly lower compared with control group ($p < .05$) (Table 2).

Comparison of the PSQI Score Between Two Groups. Before the intervention, there were no significant differences of PSQI score of each item and the total PSQI score ($p > .05$) between the two groups. After the intervention, the sleep quality, time taken to fall sleep, total sleep time, sleep efficiency, sleep disturbance, and total PSQI score of the intervention group were significantly lower than those of the control group ($p < .05$) (Table 3).

Qualitative Analysis

Basic Characteristics. Each interview took 20–60 min and no new topics emerged during data analyses. The general information of patients is shown in Table 4. 13 patients from intervention group were selected. There were nine males and four females, aged from 26 to 55 years old.

Theme 1: Strong Fear of Disease

Panic of the Disease. COVID-19 is a new disease that spreads rapidly and is highly infectious. These features have, understandably, caused panic. We found high levels of panic and anxiety in interviews with all patients. P03 stated: “I probably understand that it is spreading fast, that is to say, it is scary. It seems that it will kill people, and I think it spreads too fast. It may infect you without knowing it. It’s weird, I think”. P04 said: “I feel very anxious and scared”. P06 stated: “I was a little anxious and nervous when I just came in the hospital at that time”.

Consciousness of Disease Risk. “Risk consciousness” comprises people’s understanding and attitude towards risk, and people’s theoretical understanding and grasp of risk. Faced with such a serious infectious disease, most patients had a strong sense of risk. P02 said: “I’m infected I definitely seek medical

Table 2. Analyses of the Anxiety and Depression Status of the Two Groups.

Group	Number of Participants	SAS Score		SDS Score	
		Before Intervention	After Intervention	Before Intervention	After Intervention
Intervention group	20	62.75±7.64	44.44±5.85	58.93±6.49	46.73±7.04
Control group	20	63.35±8.40	48.03±3.23	59.73±5.04	51.84±5.73
Between groups			F (1,38) = 5.578		F (1,38) = 6.324
p			0.023		0.016

SAS = self-rating anxiety scale, SDS = self-rating depression scale.

Table 3. Subgroup Analysis for Comparison of Pittsburgh Sleep Quality Scale Scores Between the Two Groups.

Item	Time	Intervention Group (n = 20)	Control Group (n = 20)	T	p
Sleep quality	Before intervention	2.40±0.59	2.35±0.58	0.267	0.791
	After intervention	1.10±0.71	1.65±0.81	-2.268	0.029*
Time taken to sleep	Before intervention	1.95±0.75	2.00±0.85	-0.195	0.846
	After intervention	0.95±0.60	1.60±0.88	-2.717	0.010*
Sleep duration	Before intervention	1.70±0.97	1.65±0.87	0.170	0.869
	After intervention	0.85±0.58	1.40±0.94	-2.219	0.033*
Sleep efficiency	Before intervention	1.85±0.74	2.00±0.72	-0.645	0.523
	After intervention	0.90±0.64	1.55±0.75	-2.926	0.006*
Sleep disturbance	Before intervention	1.50±0.88	1.60±0.94	-0.346	0.731
	After intervention	0.85±0.67	1.35±0.74	-2.230	0.032*
Hypnotic drugs	Before intervention	0.85±0.67	0.95±0.75	-0.441	0.661
	After intervention	0.55±0.51	0.70±0.57	-0.876	0.387
Daytime dysfunction	Before intervention	1.70±0.80	1.45±0.68	-0.903	0.372
	After intervention	1.05±0.68	1.30±0.80	-1.060	0.296
Total PSQI score	Before intervention	11.95±1.95	12.00±1.45	-0.092	0.927
	After intervention	6.25±2.02	9.55±1.90	-5.311	<0.001*

*p < 0.05, which was significant.

Table 4. Questionnaire for General Information of Patients Undergoing Qualitative Research.

Patient Number	Age (years)	Sex	Marital Status	Occupation
P01	36	Male	Married	Worker
P02	42	Male	Married	Farmer
P03	49	Female	Married	Civil servant
P04	45	Male	Married	Privately or individually-owned business
P05	55	Male	Married	Privately or individually-owned business
P06	38	Male	Married	Worker
P07	43	Male	Married	Farmer
P08	48	Male	Married	Civil servant
P09	50	Female	Married	Farmer
P10	26	Male	Unmarried	Staff
P11	50	Female	Married	Farmer
P12	28	Female	Unmarried	Civil servant
P13	37	Male	Married	Privately or individually-owned business

advice. I can't wait at home". P07 stated: "I don't think it can be delayed, and I'll go directly to the hospital if I am sick". P09 said: "If you were infected with COVID-19, you need to treat it, so as not to pass it from person to person, which will cause harm to others."

Theme 2: Awareness of Active Exercise

Correct Exercise Cognition. Exercise is a good way to strengthen the body's resistance to SARS-CoV-2. Though specific medications were absent, we had excellent knowledge of exercise. P08 stated: "Baduanjin could adjust mentality, let you calm down slowly". P13 said: "This is for my own health and illness. I will stick to this Baduanjin."

Awareness of Active Exercise. Compliance with the course of exercise via exercise awareness was also a key factor for patients' rehabilitation. P05 stated: "Baduanjin's movements are gentle. It can move the muscles of the hands, feet and body. I think it is very useful. I will continue to do it when I get home". P10 said: "I feel that there is a certain relationship between mental state and exercise. The exercise is quite comfortable. I will actively exercise."

Theme 3: Good Social-Support System

Guidance and Support from Medical Staff. When patients were being treated, they should not only bear physical pain, but also the worry and fear of COVID-19. The guidance and support given by medical staff in terms of treatment and care can help to relieve the patients' anxiety and help them face the disease. P01 said: "Because of your recommendation (medical staff), we can recover better." P04 stated: "The doctors in the hospital all advocate Chinese medicine (Lianhua Wenqing capsule), which can enhance the human body's resistance and immunity, which is beneficial." P11 said: "It's all for our own body to recover a little bit faster. The videos sent by medical staff will also help our patients!"

Encouragement and Help from Family Members. Because the disease is highly contagious and spreads quickly, many patients were in isolation. There were many psychological pressures and concerns about their families, so they hoped to get encouragement and support from their families. P03 stated: "I am very anxious and very scared. Once I was diagnosed, I told my family. My family cheered me back up. They helped me not be afraid and asked me to be treated". P12 said: "Several members of our family are hospitalized. My mother is upstairs where I live. We just call each other and encourage each other. All of us will be fine". P13 stated: "My worries are mainly from home. My parents, my wife, and my children are at home. They are very worried about me. I call the family every day to report my safety."

Discussion

BQ and FEMT were beneficial therapies in treating patients with other conditions and might help patients reduce negative emotions, such as anxiety, and improve their physical condition. The treatment of the patient's condition reduced the study participants' initial anxiety and depression. If patients are in a better psychological state to overcome the disease, anxiety and depression are relieved, and the quality of sleep is improved. In current study, the intervention group treated with FEMT combined with BQ showed better relief of anxiety ($p = .023$) and depression ($p = .016$) than those in the control group. The improvement of sleep quality in the intervention group was significant ($p < .001$), which may be related to exercise. Exercise improved the patients' condition physically and mentally (Cao et al., 2020; Zou et al. 2018). The body was relaxed, the spirit was lifted, and the patients' confidence in their own health was increased.

FEMT is based on the idea of "being in harmony with people" and "heaven and humankind as one". It promotes the balance between yin and yang, the harmony of qi and blood, and qi and emotion through the traditional five-tone and six-tone law, thereby improving the patient's low mood and psychological state, reducing psychological stress and, thus, preventing anxiety and depression (Rui et al., 2018). BQ emphasizes the need to adjust shape, breath, and spirit (Zou, Yeung et al., 2018). With exercising and strengthening, patients improve their anxiety, depression, and low mood gradually. In addition, music aids sleep (Zhang et al., 2018). Our study showed that FEMT combined with BQ effectively relieved the anxiety and depression of patients with mild COVID-19 symptoms, and improved sleep and quality of life.

After patients had achieved initial exercise, we used qualitative research to explore the effects of exercise and the feelings of patients after exercise, and further verified the psychological state of anxiety and depression when the patient became sick. It was shown that patients had a strong fear of COVID-19, and the psychological state was dominated by anxiety and accompanied by panic. In addition, due to the lack of understanding of COVID-19 and media reporting, the patients' adverse psychological emotions were increased. Patients were treated and assisted by medical staff, encouraged and supported by their family. Patients adopted a positive attitude towards the condition and received adjuvant treatment with FEMT and BQ, which alleviated their anxiety and panic. Gradually, they developed a positive attitude towards exercise. With the correct exercise awareness, mental adjustment, persistence with exercise, and awareness of the close relationship between exercise, psychology, and treatment of the disease, most patients expressed their determination to continue adhering to BQ. FEMT has been shown to alleviate negative emotions, such as anxiety and depression, while BQ supports

physical and mental health without further specifiers (Zhang et al., 2018). FEMT seems to be a passive mode of intervention in which the participants just listen to music, whereas BQ seems to be an active mode in which participants needed to engage in eight movement actively. Therefore, the combination of the two treatment seems to be more effective. These results reflect the effect of FEMT combined with BQ, and how easy it is for patients to accept and continue with exercise. FEMT and BQ are cost-effective, easy to learn, and do not require dedicated venues or equipment support, which makes them easier to promote in patients. Though the control group has received standard care and the anxiety and depression status were also improved after intervention, we could still observe that the improve of the intervention group was better.

Limitation

There were also some limitations of this study. Due to time, staffing levels, and epidemic conditions, we did not conduct follow-up evaluations of the intervention group. In addition, the sample size of the study was small, and the participants were recruited from a single hospital by convenience sampling. Our intervention could only be performed in patients who had mild COVID-19 and were able physically to do these exercises. We have not evaluated the physical fitness. Other covariates affecting the intervention on anxiety and depression were also not evaluated in this study. Long term effect was not followed up in this study. Our preliminary research results confirmed the feasibility of the intervention, and its effect in patients with mild COVID-19 symptoms could be clarified by additional randomized controlled studies.

Conclusion

In conclusion, in patients with mild COVID-19, FEMT combined with BQ can improve anxiety and depression scores, sleep quality, and quality of life. After treatment, qualitative research was used to explore the patients' personal experiences. The effect of intervention was good, which has been supported and recognized by patients. As there was no specific clinical treatment for SARS-CoV-2, the adjunctive treatments, like FEMT combined with BQ could be helpful to the recovery without additional side effects. Rehabilitation professionals could provide the FEMT combined with BQ to the inpatients with mild COVID-19 to improve the disease recovery.

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Author Contributions

LSY contributed to the guarantor of integrity of the entire study, study concepts and design, literature research, clinical studies, experimental studies, data acquisition, manuscript preparation and editing. HJZ contributed to the guarantor of integrity of the entire study, study concepts and design, literature research, clinical studies, experimental studies, data analysis, statistical analysis, manuscript preparation and editing. YP contributed to the literature research, data acquisition, manuscript preparation and editing. SZT contributed to the study concepts and design. CXL contributed to the clinical studies, experimental studies. LF contributed to the experimental studies, data acquisition. TTT and QYC contributed to the data analysis. RYL and LJZ contributed to the data analysis, statistical analysis. TL contributed to the statistical analysis. GJY contributed to the guarantor of integrity of the entire study, study concepts and design, definition of intellectual content, manuscript review. All authors have given approval for the final version to be published and have agreed to be accountable for all aspects of the work.

Declarations of Competing Interest

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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Supplemental Material

Supplemental material for this article is available online.

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