

# EFFECTS OF MUSIC REGULATION ON PATIENTS WITH ANXIETY DISORDERS

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## SUMMARY

**Background:** By the end of 2021, the COVID-19 outbreak has led to an increase of 90 million patients with anxiety disorders worldwide, which has had a significant adverse impact on human mental health. Music Therapy is a treatment method that utilizes the huge influence of music on emotions, changes people's emotions through music, and finally achieves the purpose of psychological healing. This study starts with Music Therapy and selects patients with anxiety disorders from a hospital in Hebei Province, China as subjects to explore the therapeutic effect of Music Therapy on patients with anxiety disorders.

**Subjects and Methods:** The S-AI and T-AI scores of the subjects were tested before treatment, after five weeks of treatment, and after ten weeks of treatment. And both the variable correlation analysis and t-test were carried out, using SPSS22.0 as the statistical tool.

**Results:** The total STAI score of the experimental group was significantly higher than that of the control group after ten weeks of treatment ( $t = 164.102, P < 0.001$ ). After five weeks of treatment, the STAI score of the experimental group decreased significantly compared with that before treatment ( $t = 56.742, P < 0.001$ ). After ten weeks of treatment, the STAI score of the experimental group decreased significantly compared with that after five weeks of treatment ( $t = 71.155, P < 0.001$ ).

**Conclusions:** Music Therapy improves the patients' physical conditions such as sleep and energy, eating, movement and feeling. It is pain-free, low-cost, simple and easy to implement. Furthermore, it can also improve patients' interpersonal skills, work and study efficiency, as well as leisure and entertainment life satisfaction. It is worthy of promotion in the treatment of patients with generalized anxiety disorders.

**Key words:** Music Therapy - anxiety disorder - COVID-19 - music regulation

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## INTRODUCTION

Anxiety disorder is a persistent mental illness, a brain dysfunction characterized by persistent fear, tension, and autonomic dysfunction. It is often accompanied by motor restlessness and physical discomfort (Carleton et al. 2009). It is usually manifested as inattention, nervousness, distraction, restlessness, loss of interest in anything, worry about one's own health, oversensitivity to minor physical discomforts; excessive sensitivity to others and pessimism about future judgments, indecision in doing things, thinking before and after, slow in adapting to new things and new environments, and in severe cases it will affect normal work and life (Grezo & Sarmany-Schuller 2018). Since December 2019, pneumonia caused by a new type of coronavirus infection was discovered in Wuhan City, Hubei Province. And it has gradually spread to the whole country, causing great impact and harm to the production, life and even people's lives in the whole society. (Mazza et al. 2020). Professor Lu Lin, a Member of the World Health Organization's global research team on COVID-19, pointed out that the pandemic of infectious diseases will cause post-traumatic stress disorder (PTSD) in medical staff, infected people and the general public, and the incidence rate can reach more than 20%. By the end of 2021, the COVID-19 outbreak has led to an increase of 70 million depressed patients and 90 million

anxiety patients worldwide, which has had a significant impact on human mental health. And this impact will last for at least 20 years. How to relieve and treat patients with anxiety disorders or depression has become the focus of attention from all walks of life (Starcevic et al. 2007).

Music Therapy is a new applied discipline, involving a wide range of disciplines, a wide variety of application fields, and rich school ideas. Therefore, in terms of the development of Music Therapy, there is no unified discipline definition standard (Koops & Kuebel 2021). Music culture is influenced by many factors such as region, culture, history, politics, ideology, cognition, etc. Therefore, the definition of music cannot reach a consensus conclusion (Sanfilippo et al. 2021). The World Music Therapy Federation once defined Music Therapy as, it is the fringe disciplines based on the theory and method of psychotherapy. It uses unique physical and psychological effects of music, through various targeted music behaviors and music experience, to remove psychological barriers and heal body and mind (McCaffrey et al. 2011).

Patients with anxiety disorders are mainly characterized by clinical symptoms such as frequent or persistent anxiety. The causes of anxiety are complex, and both biological and sociological factors play an important role (Silverman 2019). Existing clinical research results show that specific and regular music can resonate with human cells, directly act on the

brain, muscles, bones and internal organs, and relax the nervous system. Music Therapy stimulates the body to secrete chemicals such as acetylcholine by affecting physiological functions, increasing blood flow and exciting nerves, thereby invigorating the patient's spirit and eliminating loneliness, depression and anxiety (McCaffrey 2018).

In the development of our country's health care development, the psychotherapy of Music Therapy is rarely used, and domestic scholars have little research on Music Therapy. They lack systematic theoretical content and treatment case studies as research support. In this study, patients with anxiety disorders in a hospital in Hebei Province were selected as the research objects, and the therapeutic effect of Music Therapy on patients with anxiety disorders was studied through a controlled experimental study.

## SUBJECTS AND METHODS

### Research objects

This study selected 72 patients with anxiety disorders from a hospital in Hebei Province as the research objects, among whom 31 were male patients and 41 female patients, with an age range of 20-50, and an average age of  $32.11 \pm 1.56$  years. All patients were informed and consented to the background and protocol of this study.

### Research tools

#### *General information questionnaire*

It mainly involves name, gender, age, education level, marital status, family economic level, etc.

#### *State-Trait Anxiety Inventory (STAI)*

The scale, developed by Charles D. Spielberger et al., consists of 40 descriptive items divided into two subscales. One is the State Anxiety Inventory (S-AI), including items 1-20. State anxiety describes an often transient, unpleasant emotional experience such as tension, fear, apprehension, and nervousness, accompanied by hyperactivity of the nervous system. The other is Trait Anxiety Inventory (T-AI), including items 21-40. Trait anxiety describes relatively stable, individual-specific anxiety tendencies as a personality trait (Fonseca-Pedrero et al. 2012).

Trait anxiety refers to a relatively stable behavioral tendency of an individual to react anxiously to a wide range of threatening stimuli; while state anxiety is a transient emotional state produced by the perception of dangerous stimuli, including individual tension, worry, anxiety, disturbance and hyperexcitability of the autonomic nervous system. The State-Trait Anxiety Questionnaire distinguishes two different types of anxiety, state anxiety and trait anxiety, in order to provide a more effective measurement tool for clinical practice and research (Perpina-Galvan et al. 2011).

STAI uses a four-point scoring method. 1=not at all,

2=somewhat, 3=moderately, 4=very obvious, 10 of which are reverse scoring. The original author conducted a test-retest reliability test for the scale, and found that the stability of T-AI was high, and the correlation coefficient between the two scores was 0.73-0.86; while the stability of S-AI was low, and the correlation coefficient was 0.16-0.62. Its internal consistency coefficient was determined by KR20 formula: T-AI was 0.86-0.92, S-AI was 0.83-0.92. The validity test results show that the scale is satisfactory in terms of concurrence, convergence, divergence and structure (Vitasari et al. 2011).

### Research plan

72 subjects were randomly divided into two groups, the experimental group and the control group were 36 people each. The experimental group was treated with Music Therapy, and the control group was not given special treatment. The S-AI and T-AI scores of each group were tested before treatment, after five weeks of treatment, and ten weeks of treatment to evaluate the anxiety of the testers in the past week.

### Treatment principles

First, Music Therapy should play music step by step according to the psychological characteristics of the client. From the point of view of the choice of music, it should be gradual step by step. For example, music that guides sadness can be divided into mild, moderate and severe ones. The choice of music generally starts with mild music and gradually transitions to moderately sad music. From the perspective of volume of music playing, the volume should also be gradually increased to allow visitors to gradually adapt (Moucek & Berankova 2020).

Second, during Music Therapy, clients who do not understand music should be educated and guided. And the background of music creation and the artistic conception that musicians want to express should be introduced to the clients. Before treatment, the psychotherapist can try to let the client listen to a piece of music and experience the artistic conception of the music with heart. If the client does not understand the artistic conception of the music, the psychotherapist should provide some explanations to help the client understand the meaning of the music (Silverman & Leonard 2012).

Third, during the music treatment, the treatment time should be controlled between one to two hours each time, and the appropriate treatment plan should be selected according to the different conditions of the subject to make the treatment effect appear.

Fourth, in the process of Music Therapy, we should not only pay attention to the inner feelings of the subject, but also observe the external performance and behavioral characteristics of the subject.

Fifth, in the process of treatment, attention should be paid to the use of language such as suggestion and

guidance. And the timing of its use should be grasped. In addition, subjective thoughts should not be mixed in the process of suggestion.

Sixth, during Music Therapy, if the subject has abnormal emotional reactions or bad emotions, it should be terminated in time.

In the course of Music Therapy, Receptive Music Therapy can be used for patients with anxiety disorders. The patient's mood can be stabilized and quieted by playing hypnotic music. Then anxiety-type music can be played to mobilize the patient's anxiety, so that it can find the cause of anxiety and guide the patient to be treated. After repeated training, the subject can gradually control his emotions, thereby inhibiting the generation of anxiety, and finally

achieving the goal of psychotherapy (Golden et al. 2022).

## RESULTS

SPSS22.0 was used to perform Spearman bivariate correlation analysis on the data of the experimental group and the control group before treatment. According to the test results,  $P = 0.720 > 0.05$ , and there was no correlation between the data between the two groups. The S-AI and T-AI scores of the experimental group and the control group were tested before the treatment, after five weeks of treatment, and after ten weeks of treatment. The mean values are shown in Table 1.

**Table 1.** S-AI and T-AI data statistics

	Before the treatment		After five weeks of treatment		After ten weeks of treatment	
	Control group	Experimental group	Control group	Experimental group	Control group	Experimental group
S-AI	56.98	56.29	55.89	45.63	54.23	39.56
T-AI	49.32	48.95	50.23	44.36	50.12	39.52

The test-retest reliability test results of the State-Trait Anxiety Scale showed that the stability of the T-AI test was relatively high, and the T-AI data was selected as the observation data. The data of the two groups were tested by *t*-test, and the test results are shown in Table 2. *t*-test was performed on the data

of the experimental group before treatment and after five weeks of treatment, and *t*-test was performed on the data of the control group. Similarly, the data of each group after five weeks of treatment and after ten weeks of treatment were tested, and the results are shown in the Table 3 and Table 4.

**Table 2.** *t*-test result for T-AI data

	M	S	95% CI		<i>t</i>	<i>df</i>	<i>P</i>
			Lower	Upper			
After five weeks of treatment	6.015	0.424	5.872	6.159	85.037	35.000	0.000
After ten weeks of treatment	10.647	0.389	10.515	10.778	164.102	35.000	0.000

**Table 3.** *t*-test result of T-AI data before treatment and after five weeks of treatment

	M	S	95% CI		<i>t</i>	<i>df</i>	<i>P</i>
			Lower	Upper			
Control group	-0.963	0.428	-1.108	-0.818	-13.508	35.000	0.060
Experimental group	4.585	0.485	4.421	4.749	56.742	35.000	0.000

**Table 4.** *t*-test of T-AI data after five weeks of treatment and after ten weeks of treatment

	M	S	95% CI		<i>t</i>	<i>df</i>	<i>P</i>
			Lower	Upper			
Control group	0.121	0.413	-0.019	0.261	1.761	35.000	0.087
Experimental group	4.753	0.401	4.617	4.888	71.155	35.000	0.000

The results of this study (From Table 2 to Table 4) showed that after 10 weeks of Music Therapy in patients with generalized anxiety disorders, the quality of life and anxiety symptoms of the patients were

significantly improved. Compared with the control group, after excluding the influence of conventional psychiatric treatment, the STAI total score of the experimental group was higher than that of the control

group after five weeks of treatment ( $t = 85.037$ ,  $P < 0.001$ ), and was significantly higher than that of the control group after ten weeks of treatment ( $t = 164.102$ ,  $P < 0.001$ ). It shows that Music Therapy improves the patients' physical conditions such as sleep and energy, eating, movement and feeling. It can also relieve the patients' psychological pressure, reduce anxiety and depression and other negative emotions, and experience more positive emotions such as happiness in life. Furthermore, it improves patients' cognitive function and self-esteem (Gold et al. 2017). After five weeks of treatment, the STAI score of the experimental group decreased significantly compared with that before treatment ( $t = 56.742$ ,  $P < 0.001$ ). After ten weeks of treatment, the STAI score of the experimental group was still significantly lower than that after five weeks of treatment ( $t = 71.155$ ,  $P < 0.001$ ), indicating that the long-term healing effect of music therapy was good. The STAI test results of the control group after five weeks of treatment were  $t = -13.508$ ,  $P > 0.05$ , and the STAI test results of the control group after ten weeks of treatment were  $t = 1.761$ ,  $P > 0.05$ . The results of the two groups were in line with the experimental expectations.

## CONCLUSIONS

This study demonstrates that Music Therapy is effective in short and medium-term (within ten weeks) treatment for patients with anxiety disorders. Music Therapy has neither pain suffering nor adverse reactions with a low cost. It is simple and easy to implement, while improving the patient's interpersonal skills, work and study efficiency, and leisure and entertainment life satisfaction. At the same time, it makes patients more willing to help and easier to integrate into the society and family. It deserves more promotion in the treatment of patients with generalized anxiety disorders (Golden et al. 2021). In addition, music can also have a greater impact on people's emotions. In the process of Music Therapy, there is also a situation where the subject's mood suddenly loses control. The subject who has mental health problems cannot effectively control their emotions. The therapist needs to gradually awaken the subject's emotions and choose the appropriate treatment modality to maintain the effectiveness of the treatment process (Orjasaeter et al. 2017).

In addition to the Receptive Music Therapy used in this study, other mainstream music therapies include Participatory Music Therapy and Improvisational Music Therapy (Gavrielidou & Odell-Miller 2017). Patients in Participatory Music Therapy do not need to have specialized musical training or have any musical skills, so it does not matter whether the music played or sung is good or bad (Rahman et al. 2021). Likewise, the learning of musical skills, depending on the therapeutic purpose, may or may not be musically oriented. The instruments used in Improvisational

Music Therapy are mostly simple, rhythmic and melodic percussion instruments that can be played without training, such as various drums, xylophones, triangles, etc. The therapist often plays with the piano or guitar. In the group improvisation, the patients are instructed to sit in a circle, with various musical instruments placed in the middle of the circle, allowing the patients to try one by one and choose their musical instruments freely. The patient's choice of instrument reflects his personality, his role in interpersonal relationships, and the position he is prepared to occupy in this performance. The performance often starts by a volunteer, and other members can join the performance at any time, or even not participate in playing. Therapist may decide to participate or not to participate depending on the purpose of the treatment, while in most cases they do (Gold et al. 2017). In the individual therapy of improvisation, the main purpose of therapy is to establish a good doctor-patient relationship that patients can rely on, and to help patients express and vent their emotions through spontaneous and casual performances. Improvisation can be themed, that is, the patient first decides a theme, and then everyone performs according to their own understanding. Or it can be unthemed, that is, to follow a completely free style to play (McFerran & Saarikallio 2014). The results of improvisation may be harmonious or disorganized, reflecting the interpersonal state of the entire treatment group. In most cases, the treatment model has three steps, i.e., harmony, disorder, and new harmony (Cohen & Bodner 2019). When therapists use Music Therapy methods for mental health treatment, they need to formulate coping plans and programs in advance, so that the work of music therapy can be carried out in an orderly way.

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## Contribution of individual authors:

Junhui Zhao: wrote original draft, participated in literature search and analyses, evaluations and manuscript preparation, as well as wrote the paper.

Peng Gao: conceived and designed the manuscript, interpreted the data, and participated in project administration including resources, software, validation, visualization, conceptualization, investigation and methodology.

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