Effect of Music Therapy Combined with Emotional Valence on Relieving Depression in College Students

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To investigate intervention effect of music therapy combined with emotional valence on relieving depression in college students. The clinical data of 102 college students with depression who were admitted to our hospital (October 2017-October 2018) were retrospectively analyzed, and the students were randomly split into research group (n=51) and reference group (n=51). The reference group was intervened by music therapy, while the research group was intervened by emotional valence combined with music therapy. The intervention effect was compared between two groups.After intervention, SAS scores in both groups were obviously lower (P < 0.001), and SAS scores in research group were obviously lower compared with reference group (P < 0.001). After intervention, GQOLI-74 scores in both groups were obviously higher (P < 0.001), and GQOLI-74 scores in research group were obviously higher compared with reference group (P < 0.001). After intervention, SDSS scores in both groups were obviously lower (P < 0.001), and SDSS scores in research group were obviously lower compared with reference group (P < 0.001). After intervention, SES scores in both groups were obviously higher (P < 0.001), and SES scores in research group were obviously higher compared with reference group (P < 0.001). After intervention, PSQI scores in both groups were obviously lower (P < 0.0), and PSQI scores in research group were obviously lower compared with reference group (P < 0.001). After intervention, QSA scores in both groups were obviously higher (P < 0.001), and QSA scores in research group were obviously higher compared with reference group (P < 0.001). The introduction of music therapy combined with emotional valence into the treatment of depressive disorders in college students can effectively alleviate the anxiety, improve life quality and sleep, increase self-esteem levels, reflecting obvious curative effects, which is worthy of popularization and application.

Keywords: depression of college students; music therapy; emotional valence; effect analysis

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College students, as a relatively special group, are experiencing the critical period of transition from individuals to integrating into social life, in which they are more vulnerable to academic pressure and negative events happening in interpersonal communication and employment, thus increasing the risk of depression in college students [1,2]. Some scholars believe that [3], depression will seriously damage college students' execution, lead to memory loss and lack of concentration, etc., inducing patients' suicide. The WHO survey showed that depression was an important factor leading to

adolescent suicide, and 45-55% of suicide adolescents were diagnosed with depression [4,5]. Some literatures have pointed out that the deviation of negative affectivity processing is a risk factor for depression, which is manifested by deficits in individual cognitive control and abnormal emotional processing. Individuals with negative cognition are likely to develop depression after negative events. At present, pharmacotherapy, psychotherapy and art therapy are the main treatment methods for depression, among which pharmacotherapy has defects such as severe side effects, long onset time and poor efficacy, while the psychotherapy is the first-line treatment program [6-8]. Moreover, art therapy can relax patients' body and stabilize moods by stimulating their sense organs. Music therapy is the most important form of art therapy, which is a psychological treatment based on music and has remarkable clinical effect; thus it has been widely concerned by the medical community. Emotional valence is a self-assessment of emotional attributes, namely, describing the degree to which an individual is attracted (interested) or rejected (disgusted) to a particular thing [9,10]. Based on this, in order to investigate the application value of music therapy combined with emotional valence in college students with depression, reported as below.

MATERIALS AND METHODS

General Information

The clinical data of 102 college students with depression who were admitted to our hospital (March 2017-March 2018) were retrospectively analyzed, and the students were randomly split into research group (n=51) and reference group (n=51). The research group had 28 males and 23 females, including 8 freshmen, 13 sophomores, 16 junior students and 14 senior students, with the average age of (20.31±0.42) years old, while the reference group had 26 males and 25 females, including 10 freshmen, 14 sophomores, 18 junior students, and 9 senior students, with the average age of (20.34±0.45) years old. There were no obvious differences in clinical data between two groups ($P > 0.05$), with comparability.

Inclusion Criteria

① Patients were all college students. ② Patients met the diagnostic criteria of depression in *Psychiatry*[11]. ③ This study got approval of Hospital Ethics Committee, and the patients and their families knew purpose and process of this study, and signed the informed consent.

Exclusion Criteria

① Patients had other organic or psychiatric diseases. ② Patients were unconscious and refused to cooperate with the study. ③ Patients had visual, auditory or other perceptual dysfunction. ④ Patients received psychotherapy or pharmacotherapy within the past one month.

Methods

The reference group underwent music therapy, and the specific implementation steps were as follows: the specific implementation steps and importance of the music therapy were introduced by psychologist to the patients, and the patients' cooperation degree was improved. The patients chose music tracks by themselves. At 20.00 per night, the psychologist downloaded the selected music for the patients on MP3 or mobile phone which was adjusted to appropriate decibels, and played it for 15 minutes in a loop (twice a day). Meanwhile, the patients were guided to perform limb relaxation training before bedtime for 14 consecutive days.

The research group was treated with combined emotional valence on the basis of the above. Emotional pictures in the International Affective Picture System (IAPS) were selected as the materials to induce patients' emotions and the selected pictures were neutral, positive or negative pictures with low arousal. These pictures were all the standard pictures with lower arousal than the average in the pictures with the same emotional valence, among which there were 50 positive pictures (valence: 7.71±0.14, arousal: 4.615±0.26), 50 neutral pictures (valence: 4.96±0.13, arousal: 3.53±0.36) and 50 negative pictures (valence: 2.73±0.15, arousal: 4.61±0.26). Besides, the norm should be strictly followed during the selection and the pictures that would cause gender differences

and pornography should be excluded. Positive pictures include images of children, families, small animals, etc., neutral pictures include daily necessities, green plants, etc., and negative pictures include crying, pollution, etc. In the study, the patients were randomly presented with pictures and told to pay attention to the contents of the pictures so as to better induce emotions. The size of the pictures was 599×499, with black background, and the intervention lasted for 14 days.

Evaluation Indexes

① The Self-rating Anxiety Scale [12] (SAS) was adopted to evaluate the anxiety levels in both groups before and after intervention with the total score of 100 points. Higher score indicated more serious anxiety.

Points (< 50) were normal, points (50-59) were mild anxiety, points (60-69) were moderate anxiety and points (> 69) were severe anxiety.

② The patients' life quality in the two groups before and after the intervention was evaluated with the Generic Quality of Life Inventory-74 [13] (GQOLI-74), which was scored from four factors: psychological function, physical function, social function and material life condition. Higher score indicated better life quality.

③ The social function of the patients in the two groups before and after intervention was evaluated by referring to the Social Disability Screening Schedule [14] (SDSS), with the total score of 20 points and higher score indicated more serious social function defects of patients.

④ The Self-esteem Scale [15] (SES) was adopted to evaluate the self-esteem levels in both groups before and after intervention. Higher score indicated higher self-esteem levels.

⑤ Sleep quality in both groups before and after intervention was evaluated by the Pittsburgh Sleep Quality Index [16] (PSQI). Higher score indicated worse sleep quality.

⑥ The suicide attitudes of patients in the two groups before and after intervention were evaluated by the Suicide Attitudes Questionnaire [17] (QSA), which included attitudes towards suicides, attitudes towards suicides' family members, and attitude towards suicide behavior. The total score of each item was 6 points and lower score indicated more significant suicide tendency.

Statistical Treatment

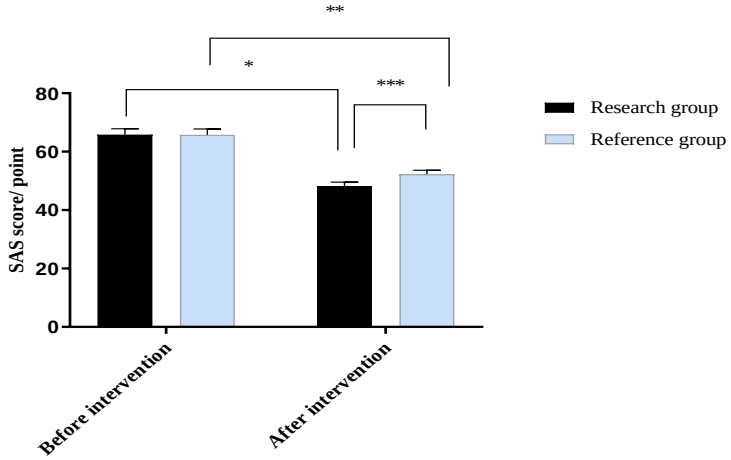
SPSS20.0 software was adopted to statistically analyze and process the experimental data. Measurement data were expressed by ($\bar{x}\pm s$) and tested by t-test. Enumeration data were expressed as [n(%)] and tested by X^2 test. The differences had statistical significance when $P<0.05$.

RESULTS

Comparison of SAS Scores

After intervention, SAS scores in both groups were obviously lower, and SAS scores in research group were obviously lower compared with reference group ($P < 0.05$), as detailed in Figure 1.

Figure 1 Comparison of the SAS scores

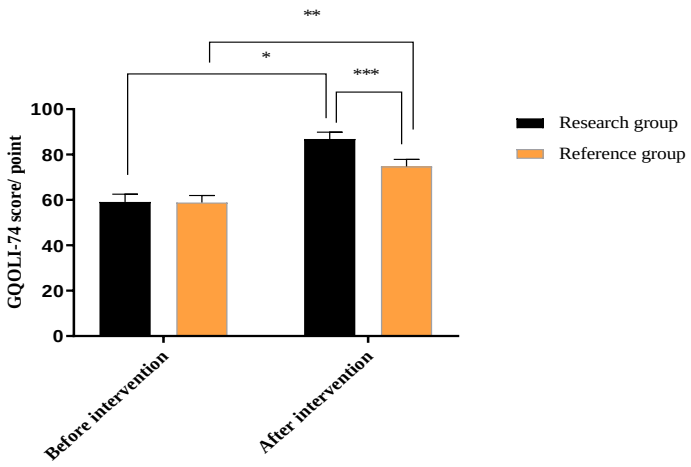


Note: The abscissa indicates before and after intervention, while the ordinate indicates SAS score.
In the research group, the SAS scores before and after intervention were (64.37±2.86) points and (47.23±1.93) points, respectively.
In the reference group, the SAS scores before and after intervention were (64.40±2.78) points and (51.37±1.88) points, respectively.
* indicates an obvious difference in SAS scores in research group before and after intervention (t=35.476, P=0.000).
** indicates an obvious difference in SAS scores in reference group before and after intervention (t=27.727, P=0.000).
*** indicates an obvious difference in SAS scores between two groups after intervention (t=10.973, P=0.000).

Comparison of the Gqoli-74 Scores

After intervention, GQOLI-74 scores in both groups were obviously higher, and GQOLI-74 scores in research group were obviously higher compared with reference group ($p < 0.05$), as detailed in Figure 2:

Figure 2 Comparison of the GQOLI-74 scores ($\bar{x}$±s)



Note: The abscissa indicates before and after intervention, while the ordinate indicates GQOLI-74 score.
In the research group, the GQOLI-74 scores before and after intervention were (56.73±4.79) points and (84.72±4.27) points, respectively.
In the reference group, the GQOLI-74 scores before and after intervention were (56.71±4.34) points and (72.66±4.29) points, respectively.
* indicates an obvious difference in GQOLI-74 scores in research group before and after intervention (t=31.150, P=0.000).
** indicates an obvious difference in GQOLI-74 scores in reference group before and after intervention (t=18.666, P=0.000).
*** indicates an obvious difference in GQOLI-74 scores between two groups after intervention (t=14.229, P=0.000).

Comparison of the SDSS Scores

After intervention, SDSS scores in both groups were obviously lower ($P < 0.001$), and SDSS scores in research group were obviously lower compared with reference group ($P < 0.05$), as detailed in Table 1.

Table 1 Comparison of the SDSS scores ($\bar{x}$±s, point)

Group	n	Before intervention	After intervention	T_2	P_2
Research group	51	13.35±1.42	7.87±1.22	20.904	0.000
Reference group	51	13.32±1.39	10.46±1.33	10.617	0.000
T_1		0.108	10.248	/	/
P_1		0.914	0.000	/	/

Note: T_1P_1 indicates the comparison of the SDSS scores between the two groups before and after intervention, and T_2P_2 indicates the comparison of the SDSS scores in the two groups before and after intervention.

Comparison of the SES Scores

After intervention, SES scores in both groups were obviously higher ($P < 0.001$), and SES scores in research group were obviously higher compared with reference group ($P < 0.05$), as detailed in Table 2.

Table 2 Comparison of the SES scores ($\bar{x}$±s, point)

Group	n	Before intervention	After intervention	T_2	P_2
Research group	51	21.59±4.54	28.71±3.66	8.719	0.000
Reference group	51	21.57±4.51	23.96±3.28	3.061	0.003
T_1		0.022	6.902	/	/
P_1		0.982	0.000	/	/

Note: T_1P_1 indicates the comparison of the SES scores between the two groups before and after intervention, and T_2P_2 indicates the comparison of the SES scores in the two groups before and after intervention.

Comparison of the PSQI Scores

After intervention, PSQI scores in both groups were obviously lower ($P < 0.0$), and PSQI scores in research group were obviously lower compared with reference group ($P < 0.05$), as detailed in Table 3.

Table 3 Comparison of the PSQI scores ($\bar{x}$±s, point)

Group	n	Before intervention	After intervention	T_2	P_2
Research group	51	16. 69±3.26	8.74±2.18	14.477	0.000
Reference group	51	16.71±3.23	13.65±2.07	5.696	0.000
T_1		0.031	11.664	/	/
P_1		0.975	0.000	/	/

Note: T_1P_1 indicates the comparison of the PSQI scores between the two groups before and after intervention, and T_2P_2 indicates the comparison of PSQI scores in the two groups before and after intervention.

Comparison of the QSA Scores

After intervention, QSA scores in both groups were obviously higher ($P < 0.001$), and QSA scores in research group were obviously higher compared with reference group ($P < 0.05$), as detailed in Table 4.

Table 4 Comparison of the QSA scores ($\bar{x}$±s, point)

Group	n	Attitude towards suicides		Attitude towards suicides' family members		Attitude towards suicide behavior	
		Before intervention	After intervention	Before intervention	After intervention	Before intervention	After intervention
Research group	51	1.19±0.44	3.86±0.54	1.18±0.42	3.32±0.35	0.84±0.16	4.98±0.25
Reference	51	1.17±0.39	2.41±0.	1.15±0.46	2.42±0.21*	0.81±0.19	3.42±0.23*

group	1	32*

Note: The attitudes towards suicides and suicides' family members as well as the understanding of the suicide behavior after intervention in both groups were significantly better; * indicates that the comparison between two groups after intervention, $P < 0.05$.

DISCUSSION

Some foreign scholars have put forward the concept of susceptibility in clinical research, that refers to some mental diseases or obstacles in patients caused by interaction between the quality (susceptibility) existing in patients themselves and environmental factors [18]. With the continuous research and exploration of psychiatric diseases, stress model was introduced to explain such diseases. Jianzhuo Yan et al. [19] believed that this model can better explain the pathogenesis of depression, and some scholars believed that when faced with negative events in their life, people tended to deduce the causes, results and self-worth of these events. Individuals with depression susceptibility tend to have the following characteristics: ① They believe that the negative event will induce the generation of other negative events. ② The occurrence of negative events always attributes to patients' own self defect or unworthiness. ③ They believe that the occurrence of negative events is difficult to change or will cause a greater adverse impact [20]. The occurrence of negative events can become a trigger point to activate depressive moods, so that the occurrence of depression-related scenes is repeated in the brain due to the sustaining depressive moods, leading to the generation of depression [21,22]. At present, college students' main psychological problems include academic difficulties, interpersonal communication, employment, relationship, etc. The intertwining of all kinds of unfavorable factors will make college students feel stressed, seriously frustrate their enthusiasm for life and learning, and induce many psychological problems. Therefore, carrying out necessary psychological guidance for college students can help them establish a healthy personality, maintain mental health and better integrate into society. Music has become an important way for people to cultivate minds and mold characters since ancient times. Because of its own art and rhythmic beauty, music conveys its connotation through the change of rhythm. Music will make individuals produce psychological resonance, so as to obtain satisfaction and better complete emotional release. Shoji Tsuji et al. [23] believed that music would make patients with depression resonate both in mind and emotion, thus building a bridge between feeling and emotion, which can help patients better open their minds and enjoy communicating with others.

Emotional valence suggested that there were certain differences between reactivity and active control among different susceptible individuals with depression, and the differences were controlled by positive or negative emotions. Besides, it's also believed that depression would damage college students' cognitive control. This paper found that SAS scores in research group after intervention were obviously better compared with reference group. DanielNeu et al. [24] pointed out that music therapy combined with emotional evaluation can significantly alleviate the anxiety of depressive patients. After intervention, SAS scores of (47.37±2.18) points in the research group were significantly lower than (52.14±2.34) points in the reference group, suggesting that the combined intervention can effectively reduce the anxiety of depressive patients, so that the adverse emotions generated by the patients themselves can be reasonably vented. Many clinical studies have confirmed that [25], patients with depression have different degrees of sleep disorders, and 3/4 of them have severe sleep disorders such as difficulty in falling asleep, insomnia and dreaminess, and the continuous aggravation and repetition of these disorders will make patients suffer from mental and physiological double pressure and finally induce suicide. This study also found that patients' sleep quality in research group after intervention was

obviously better compared with reference group, suggesting that the combined intervention improves sleep quality of patients with depression and reduces psychological stress. The shortcomings of this study are that the number of subjects selected is small, and the regional cultural differences among individuals are not taken into account[26]. Therefore, the conclusions of this study are not sufficiently representative and need to be further verified.

In conclusion, the combined intervention can effectively improve depressive college students' anxiety, sleep quality, life quality, psychological resilience, and reduce suicidal behavior, which is worthy of popularization and application.

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