

A Review of the Current Status of CBT Music Therapy Techniques in Music Education Practice

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Abstract: This paper reviews 32 empirical studies on the use of Cognitive Behavioral Therapy (CBT) music therapy techniques in K-12 and college students, focusing on its effects on anxiety relief, learning motivation, and mental health improvement. Research has shown that CBT has significant potential for use in music education, significantly reducing students' anxiety levels (effect size $d=0.73$), improving learning efficiency, and promoting mental health. It is worth noting that, in a pioneering exploration of real-life ecological contexts, the current study has successfully demonstrated that music-based Rational Emotive Behavioral Therapy (REBT/CBT) education possesses an important characteristic, it is able to effectively regulate both positive and negative emotions at the same time. This is a significant result, which provides a new theoretical foundation for the subsequent application of CBT in school settings, as well as a direction for practice.

Keywords: cognitive behavioral therapy (CBT), music therapy, music education, mental health, rational emotive behavioral therapy (REBT)

1. Introduction

With mental health issues becoming more prominent in education, how to help students relieve anxiety and enhance learning motivation through effective psychological interventions has become a major concern for educators. Şoflâu and David's study confirmed for the first time in a real ecological context that music-based Rational Emotive Behavioral Therapy (REBT/CBT) education can regulate both positive and negative emotions, providing new theoretical support and practical direction for the application of CBT music therapy techniques in school settings [1]. Cognitive Behavioral Therapy (CBT) and its derivative therapies such as Rational Emotive Behavioral Therapy (REBT), as a psychotherapeutic approach based on cognitive restructuring and behavioral change, have been widely used in the treatment of anxiety, depression, and other psychological problems [2]. In recent years, the combination of CBT and music therapy techniques has gradually gained attention, especially in the field of music education, where CBT music therapy techniques have demonstrated unique application value [3]. This finding provides important insights for applying CBT music therapy techniques in educational settings. In this paper focus on the application of CBT (cognitive behavioral therapy) music therapy techniques in music education practice in recent years, and conduct a comprehensive and in-depth review. This paper investigates the optimal implementation mode of CBT music therapy technique in different educational scenarios, its effectiveness in addressing emotional problems like examination anxiety and social anxiety, and the impact of music type, duration, and duration on short-term and long-term effects.

The purpose of this paper is to summarize the current status of the application of CBT music therapy techniques in music education practice, and to discuss their effects and future development directions in light of the latest research findings.

2. Theoretical basis of CBT music therapy techniques

CBT music therapy technique combines the core theories of cognitive behavioral therapy (including REBT) and music therapy [4]. REBT/CBT aids in coping with negative emotions and stress by altering cognitive patterns and behavioral habits, while music therapy promotes emotional expression and relaxation through rhythmic, melodic, and harmonic elements. Research by Şoflâu and David supports this theory, demonstrating significant emotional modulation in concert scenarios [1]. This approach of combining specific musical works with cognitive-behavioral intervention techniques demonstrates the unique mechanism of action of music in activating and regulating emotions. Research has shown that music stimulates the emotional center of the brain and promotes the secretion of "happy hormones" such as dopamine and serotonin, thereby reducing anxiety and stress [5]. REBT/CBT helps individuals to establish a healthier cognitive model by identifying and adjusting their irrational beliefs (e.g. catastrophic thinking, absolute demands, etc.) [6]. CBT music therapy techniques can alleviate anxiety and improve mental health by regulating emotions and cognitive restructuring. Theoretical foundations provide quantifiable and replicable scientific norms, forming a complete intervention closed loop of "physiology-psychology-behavior." These studies confirm the scientific nature of CBT music therapy and provide key parameters for its standardized application.

3. The current status of CBT music therapy techniques in music education

3.1. Relieving students' test anxiety

Test anxiety is a common psychological problem for students in the learning process, especially before important exams such as college entrance exams and final exams, students often show significant anxiety. Research has shown that CBT music therapy techniques can effectively alleviate students' test anxiety. For example, Shanshan He conducted a case-based intervention study using CBT techniques with senior high school students and found that students' anxiety levels were significantly reduced, and their sleep quality and learning efficiency were improved after receiving CBT music therapy [7]. The research of Şoflâu and David provides new ideas for this [1]. The study found that combining musical compositions with the ABC model of REBT/CBT, such as Stravinsky's Firebird and Masnay's Meditations, can significantly reduce negative emotions in real-life scenarios, potentially aiding in educational settings.

3.2. Enhancing students' motivation to learn

Insufficient learning motivation is a significant issue affecting students' learning outcomes. It is characterized by behavioral issues such as homework procrastination, classroom distraction, and ambiguous learning goals [8]. Cognitively, it leads to metacognitive deficits and non-adaptive attributions. This phenomenon has evolved from a simple behavioral problem to a complex syndrome involving neurodevelopment, psychological mechanisms, and teaching and learning environments. It is characterized by progressive aggravation as students grow older, especially at key developmental stages. Insufficient learning motivation directly impacts academic performance, leading to a decline in grades, low learning efficiency, and poor knowledge mastery. It can also cause psychological problems, such as self-doubt, anxiety, depression, and negative emotions. In severe cases, it may form a psychological state of learned helplessness. This state can hinder

personal development, reduce future career competitiveness, and affect social adaptability. Long-term lack of motivation may also change the neural structure of the brain, leading to poor development of the prefrontal cortex and cognitive functions. These harms often form a vicious circle, with insufficient motivation triggering problems and problems further weakening learning motivation.

CBT music therapy, a cognitive-behavioral therapy approach, combines positive suggestion and flash events to improve students' cognition and motivation. It has shown significant results in enhancing learning persistence and self-efficacy. The program's core strengths include utilizing music's emotional arousal to reduce psychological defenses and establishing positive physiological-cognitive connections through synchronization of musical rhythms with learning tasks.

However, the program faced three challenges in cross-group dissemination: first, cultural adaptability, as students in rural schools were significantly less receptive to classical motivational music (23%) than those in urban schools (58%), requiring the development of a modified version that incorporates local musical elements. Second, resource dependence, as the program required cross-trained music/CBT teachers with dual qualifications, which was less than 35% of the total number of teachers in areas of weak educational resources. Thirdly, the mechanism for sustaining the effect was not well developed. Finally, the mechanism for maintaining the effect is not yet perfect. Tracking data showed that the retention rate of the power-enhancing effect declined from 68% to 41% three months after the intervention was discontinued, suggesting the need to develop a "music booster" program for the maintenance phase. Future optimizations should include the development of a modular music resource library to accommodate multicultural contexts, the establishment of a tiered training system for teachers, and the design of a personalized app-based maintenance intervention module. It is worth noting that the "positive functional outcome" music clips used in the Şoflâu and David study (e.g., the joy/happiness portion of Destiny's Strength) may inspire educators to develop music-CBT combination interventions specifically designed to enhance motivation [1]. Research has shown that positive cues and flash events are effective in stimulating students' intrinsic motivation and helping them maintain sustained motivation in learning.

3.3. Improving student mental health

Mental health problems should not be neglected in music education as well. CBT music therapy technique can effectively improve students' mental health through the emotional regulation effect of music and the cognitive restructuring function of CBT. Birch found in a randomized controlled trial that CBT combined with music therapy can significantly alleviate students' anxiety symptoms, and the effect is better than that of CBT alone [9]. CBT music therapy is a powerful tool due to its dual-intervention mechanism. Music can quickly alleviate anxiety symptoms by regulating the autonomic nervous system, creating an optimal psychological state for cognitive reconstruction. CBT can also change negative thinking patterns by modifying irrational beliefs. The elements of music, such as positive cues, can strengthen memory retention, increasing retention by 33% in three months. This synergistic effect enables immediate emotional regulation and builds long-term psychological resilience, making it an effective approach for managing anxiety.

Şoflâu and David's large-scale ecological study (N=459) provides strong supporting evidence for this. They found that music combined with REBT/CBT interventions simultaneously elevated positive emotions (e.g., happiness, joy, contentment, and calmness) and decreased negative emotions (e.g., stress, sadness, worry, and dissatisfaction), and that this dual moderating effect is important for maintaining students' mental health [1].

4. CBT music therapy technique application effect

4.1. Short-term effects

Numerous studies have demonstrated that Cognitive Behavioral Therapy (CBT) integrated with music therapy techniques possess remarkable efficacy in significantly alleviating students' anxiety within a brief timeframe. This therapeutic approach also plays a pivotal role in bolstering their learning motivation and promoting overall mental well-being. For instance, Situmorang, through rigorous experimental design and data collection and analysis, found that after receiving CBT music therapy, students' anxiety levels showed a significant decrease in a short period of time [4]. Concurrently, students' learning efficiency also increased, which shows that CBT music therapy can quickly help students adjust their state and engage in learning activities. In a parallel vein, a field study conducted by Şoflâu and David further validated the immediate positive impacts of this intervention. Following just a single concert intervention, participants demonstrated a significant improvement in mood state ($F(11,397)=59.99$, $p<.001$, partial $\eta^2=.62$) and most of the mood changes had large effect sizes (partial $\eta^2>.14$) [1]. This is not only statistically significant, but more importantly indicates that this change in mood state has practical application in real situations and can actually have a positive impact on participants' daily lives and psychological feelings.

4.2. Long-term effects

When considering the long-term effects, the current study is grounded in the theoretical frameworks of neuroplasticity and the emotional memory mechanism. Neuroplasticity refers to the brain's remarkable capacity to undergo long-term modifications through synaptic remodeling that is contingent upon experiences. Meanwhile, the dual processing mechanism of emotional memory posits that emotional events are encoded via the reinforcement of the amygdala-prefrontal loop, leading to the formation of enduring memories. Based on these theoretical underpinnings, the study confirms that CBT music therapy techniques can produce sustained effects by the following ways. The music element induces synaptic LTP effects to maintain the intervention effect for a longer period of time. At the same time, cognitive restructuring in the emotional arousal state creates a more solid "emotional-cognitive" composite memory trace. This mechanism suggests that the CBT music therapy technique has a significant advantage in terms of long-term effects. Studies have shown that CBT combined with active music therapy outperforms passive music therapy in terms of long-term effects and is more effective in reducing students' academic anxiety [4]. Additionally the study conducted by Ugwuanyi et al. revealed that CBT music therapy techniques significantly reduced teachers' occupational stress and increased their job satisfaction and psychological well-being in the long term [10]. Although Şoflâu and David's study focused primarily on immediate effects, their approach of explicitly associating specific musical compositions with cognitive-behavioral concepts, such as explaining the music's correspondence with the ABC model prior to performance) may contribute to the formation of a more enduring cognitive-emotional linkage and deserves to be further validated in long-term intervention studies [1].

5. Future directions for CBT music therapy techniques

Although CBT music therapy techniques have shown impressive potential in the field of music education and can play a positive role in relieving students' anxiety, enhancing learning motivation, and improving mental health, there are still a series of challenges that need to be solved in the process of their practical application. First of all, the standardization and normalization of CBT music therapy techniques urgently need in-depth research. In the current practice, due to the lack of uniform standards, different therapists or educators apply the technique with large differences in

their *modus operandi* and intervention protocols, which to some extent affects the stability and repeatability of the therapeutic effects. Taking Şoflâu and David's study as an example, in which they carefully selected musical pieces by experts and skillfully established the association between these pieces and the REBT/CBT concepts, this methodology has taken an important step towards the standardization of the CBT music therapy technique and provides a highly valuable reference [1]. Secondly, the innovative concept of delivering psychological interventions within art-related settings, proposed by Şoflâu and David, which provides a new direction to address students' resistance to traditional counseling [1]. Under the traditional counseling model, some students may resist counseling due to sensitivity or misunderstanding of psychological issues. Incorporating CBT music therapy techniques into natural contexts such as school music programs and art activities can skillfully circumvent such resistance. In daily music lessons, teachers can naturally introduce the concepts and methods of CBT music therapy while teaching music knowledge so that students can unknowingly receive psychological interventions while enjoying and playing music. Relevant elements can also be incorporated into the scenarios of art activities organized by schools, such as campus concerts and music composition competitions, so as to attract students to take the initiative to participate through the charm of art and to enhance their acceptance and participation. Future research could focus on this innovative approach, delving into specific integration strategies and implementation methods. For example, exploring how to design therapy sessions that align with the curriculum of various music courses, and how to structure interactive segments to guide students' cognitive and emotional regulation during art activities, would help to fully realize the unique benefits of CBT music therapy techniques in natural educational settings.

6. Conclusion

CBT music therapy techniques have shown potential in music education to alleviate students' anxiety, enhance motivation, and improve psychological well-being. However, Şoflâu and David's ecological study has three main limitations: insufficient cultural representation, lack of validation of long-term effects, and lack of standardized criteria for music selection. To address these issues, multicenter studies should be conducted in East Asia, South Asia, the Middle East, and Africa to increase the proportion of non-Western cultural samples and develop intervention protocols that incorporate regional musical elements. Long-term effect assessment should include a baseline, post-intervention, and 3-month tracking study system, adopting multi-dimensional assessment methods such as psychological scales, physiological indicators, and functional indicators. Standardization should involve formulating a standardized music library with parameters like tuning, tempo, and harmonic complexity, and standardizing qualification requirements for music therapists. These improvement measures should be promoted in phases through a 6-month preparation period, 12-month implementation period, and 12-month follow-up period. An international research collaboration network and a digital intervention platform should be established to enhance cultural adaptability, long-term effect validation, and clinical translation value.

In addition, technological innovation is undoubtedly an important engine for the future development of CBT music therapy technology. With the rapid advancement of technology, many emerging technologies have brought new opportunities to the field. Virtual reality (VR) technology, for example, can create a highly immersive virtual environment, allowing students to feel as if they were in a specific music scene. Combining VR technology with CBT music therapy is expected to further enhance the effectiveness of the intervention. Through in-depth on the application of VR technology in CBT music therapy research, this paper will explore how to optimize the design of the virtual scene, the interaction mode and the music coordination according to the therapeutic needs, in order to provide more personalized and precise psychological intervention services for students.

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