Dean&Francis

ISSN 2959-409X

The Impact of Music Therapy on Individuals with Autism

Qixuan Weng[1, *]

Lipu Yan[2]

Jingxuan Zhang[3]

[1]School of High School Affiliated To Nanjing Normal University, Nanjing, China
[2]School of One Infinity Academy, Zhengzhou, China
[3]School of Aquinas International Academy, Ontario, USA

*Corresponding author: 18512501057@163.com

Abstract:

Autism is a complex condition, and researchers have long debated potential treatments for this diagnosis. Autism, also known as autism spectrum disorder (ASD), encompasses a range of neurodevelopmental disorders affecting brain development. While some characteristics can be detected in early childhood, autism is often not diagnosed until later. The disorder is primarily characterized by difficulties in social interaction and communication. Other features include atypical behaviors and patterns, such as challenges in transitioning between activities, hyper-focus on details, and abnormal responses to sensory stimuli.Among the various therapeutic options, music therapy has emerged as one of the most promising approaches, with numerous studies yielding significant findings. This paper aims to provide an overview of the key findings and therapeutic approaches in the field of music therapy for individuals with autism.The therapies discussed in this paper include improvised music therapy and family-centered music therapy (FCMT). By tracking feedback from relatives, conducting clinical observations, or performing medical evaluations, clinicians can help individuals with autism using these targeted techniques and assess their effectiveness. Some therapies, such as FCMT, have been shown to improve social connections and strengthen family bonds in autistic individuals. However, they do not necessarily enhance language skills or sensory responsiveness. Additionally, therapies like Orff music therapy have been found to influence patients' moods, offering psychological benefits such as calming, stimulation, and emotional regulation.

Keywords: autistic; family music therapy; Improvised music therapy.

1. Introduction

Autism spectrum disorder (ASD), also known simply as autism, is a neurodevelopmental condition that begins early in life and is characterized by persistent deficits in social interaction and communication, as well as restricted, repetitive patterns of behavior, interests, or activities. Autism can also be classified based on whether it is accompanied by intellectual

developmental disorders. Prevalence estimates for autism vary significantly, with the median rate being around 1%. The prevalence of autism continues to rise, and it is approximately four times more common in males than in females[1].

In addition to the two core symptoms, abnormal sensory processing is also a common feature of autism. Individuals with autism exhibit a wide range of symptoms, and while there may be some overlap, the severity of the condition varies greatly from person to person. Some individuals with autism may never develop spoken language, while others have no difficulty with speech [2]. Autism spectrum disorder is believed to have a strong genetic basis, with numerous genes potentially involved. However, the condition is likely influenced by environmental factors as well, given the complexity of the genetic connections[3-4].

There is no standard treatment for autism spectrum disorder (ASD), but symptoms can be alleviated through various interventions such as behavioral management therapy, cognitive behavioral therapy (CBT), early intervention, educational and school-based therapies, joint attention therapy, medication, nutritional therapy, occupational therapy, parental intervention therapy, physical therapy, social skills training, and speech therapy.

As an innovative therapeutic approach, music therapy has garnered significant attention in recent years, particularly in the treatment of autism. The positive effects and hypotheses surrounding the influence of musical stimulation on emotional and cognitive processes have made music therapy a prominent topic in both research and practice. Music therapy has been shown to improve the core symptoms of autism, enhance social communication, stimulate speech, regulate emotions, improve attention, and boost memory.

The aim of this review is to systematically analyze and assess the research findings and current applications of music therapy in the treatment of autism. By examining the theoretical foundations, methodologies, and empirical results of various studies, we will explore the effects of music therapy on the emotional, psychological, and physiological aspects of individuals with autism. Additionally, we will compare music therapy to traditional treatment methods to demonstrate its effectiveness and impact on autistic patients, with the goal of providing theoretical support and practical insights for future clinical trials and research[5].

2. Symptoms and Physiological Characteristics of Autism

2.1 The main symptoms of autism

The main symptoms of autism include: (1) Social communication disorders, typically manifested as difficulty in interacting with others or a lack of communication skills, and an absence of secure attachment relationships with parents. (2) Language communication disorders, which may present as delayed language development, language regression after initially normal development, or speech that lacks communicative intent. (3) Repetitive, stereotyped behaviors. Atypical autism, however, does not necessarily exhibit deficits in all three areas, with only one or two being affected.

Autism may be influenced by genetic factors, or potentially linked to parental personality traits and family dynamics. However, attributing autism solely to parenting and family structure was eventually recognized as overly simplistic. To date, research has not reached a definitive conclusion regarding the causes of autism. The prevailing consensus is that the pervasive developmental disorders observed in autistic individuals are primarily driven by biological factors in the brain. The underlying causes of these biological changes are explored through various lenses, including medical biology, neuropsychology, and ecology. Traditional Chinese medicine (TCM) has also addressed autism from the perspective of differential diagnosis, laying the foundation for TCM-based therapies, such as massage, to treat children with autism.

Autism is characterized by challenges in social interaction and communication. Additional traits include atypical activity and behavior patterns, such as difficulty transitioning between activities, hyper-focus on details, and abnormal emotional responses. The abilities and needs of individuals with autism vary and may change over time. While some individuals with autism can live independently, others may require lifelong care and support. Autism often impacts educational and employment opportunities. Moreover, the demands placed on family members providing care and support can be significant. Social attitudes, as well as the availability of support and services from local and national authorities, play a crucial role in determining the quality of life for individuals with autism.

2.2 Physiological characteristics

Deficits in social communication and interaction are widely recognized as the core symptoms of autistic spectrum conditions (ASC) and align with the lived experiences of individuals with ASC. These deficits are often linked to sensory processing issues and emotional dysregulation. Additionally, cognitive and communication impairments are considered secondary to motor expectation control and the development of sensory-motor skills, which are crucial for effective interaction. Inter-subjectivity relies on „the synchronization of timing and rhythm between two motor systems in terms of timing and tone, resulting in ‚communicative musicality' in mutual behavior." This sense

ISSN 2959-409X

of movement timing is essential for social understanding, the formation of shared meaning, and the natural development of family rhythms and patterns, but it appears to be disrupted in individuals with ASC. Discrepancies in the organization, synchronization, and regulation of sensory information and movement may hinder physical and mental development in these individuals.

Thus, it is suggested that increased attention be given to the sensory experiences, movements, vocalizations, and emotions of children with ASC as valuable resources for fostering expression, communication, and participatory meaning. Many therapeutic approaches employed by researchers recognize the importance of sensory processing, movement control, motor-emotional synchronization, and emotional regulation. These approaches may create opportunities for children with ASC to develop shared narratives and enhance their social interaction skills [6].

3. Music Therapy for Individuals with Autism

3.1 Family music therapy

Family music therapy focuses on fostering and cultivating relationships between children and those around them. It employs live music creation to engage children, providing opportunities for shared experiences. Unlike improvised music therapy, this approach enhances the role of family members in the therapeutic process by involving them in the child's treatment beyond formal sessions (e.g., synchronizing daily intra-family treatment activities)[7]. This method emphasizes developing the child's interactive experiences with the external world rather than establishing a reward-based system for communicative behavior. Compared to speech therapy, family music therapy highlights non-verbal communication, which can alleviate the pressure of verbal interaction for patients.

For children with communication disorders, verbal communication is often constrained by their abilities, limiting the effectiveness of external exercises that rely on speech to maintain meaningful relationships. This approach requires family members to work with a music therapist to select prescribed music interventions for one-on-one treatment with the child. During the treatment phase, families continue to reinforce the child's social behaviors through music. Numerous studies (specific examples will be discussed in the paper) suggest that family music therapy helps improve children's verbal and non-verbal communication, motor skills, cognitive abilities, and more. However, current research is limited by small sample sizes, and the role of parents in the therapeutic process remains unclear, warranting further exploration. Additionally, the efficacy of this therapy as a specific treatment for autism has yet to be definitively proven. It is also uncertain whether the psychological and neurophysiological effects of this therapy on healthy individuals are consistent with those observed in autistic patients. Thus, more research is needed to elucidate the underlying mechanisms and assess the therapeutic outcomes across individuals with varying physiological conditions.

Specific effects of this therapy include the coordination of music and emotion to create synchronized moments, which facilitate sensory integration, emotional regulation, and the formation of shared relationships. Successful synchronization is believed to enhance children's self-awareness, life experiences, and communication skills. Music can be connected to observable behaviors, internal emotional states, body movements, sounds, and emotional dynamics in children[7].

Similar to how a primary caregiver interacts with an infant, music therapists use rhythm, sound, and dynamic pre-linguistic musical features to establish emotional attunement and support coherence between the child's internal feelings and emotional patterns, as well as between the child and the therapist.

3.2 Improvised music therapy (IMT)

Improvisational Music Therapy, also known as creative expression music therapy, allows patients to engage in spontaneous music-making under the professional guidance of a therapist. Patients are encouraged to play music freely, often using simple percussion instruments, with the mode of improvisation being determined by their own preferences. This approach is minimally restrictive, which helps reduce the psychological burden on patients and fosters improvements in responsiveness, social skills, and enthusiasm for external interactions. Through carefully designed improvisational music activities, therapists provide multisensory stimulation to individuals with autism, who may experience physiological, cognitive, and emotional challenges. These activities aim to reduce abnormalities in various physiological indicators, ultimately alleviating symptoms and supporting the patient's ability to regain a sense of normalcy.

Research on improvisational music therapy, such as Holck's study, suggests that music therapists use "response-evoking techniques" in this form of therapy. These techniques involve creating mutually meaningful and enjoyable musical interactions based on the child's expressions and focus of attention. Such approaches have the potential to engage children and encourage their participation in joint music-making. The therapy primarily revolves around the patient's emotional and behavioral responses during treatment, including emotional synchronization and changes in the frequency of participation in external activities, as well as the effects on interpersonal

relationships, such as the frequency of interactions between the patient and the therapist.

Wigram and Elephant explain how music therapists can leverage improvisational music-making to provide children with autism spectrum disorder (ASD) opportunities to experience both structure and measurable flexibility, helping them cope with the unpredictable situations that often challenge them[8]. Recent studies indicate that improvisational music therapy has a more stable and effective impact on regulating patients' emotions compared to traditional entertainment options like toys and other children's activities. Improvisational music therapy is believed to increase the frequency of children's engagement in interactive behaviors, thereby stimulating internal joy and fostering emotional resonance. This therapeutic effect is attributed to the process of musical "tuning," which helps autistic children develop emotional skills within social environments and promotes the generation of more positive emotions.

Research on improvisational music therapy provides a further understanding of the specific mechanism of music therapy, [8]that is, the reason why the coordination brought by music is more effective than conventional coordination may result in the different abilities of autistic patients' cognitive functions in different regions. Autistic children were found to have impaired perception of language and social auditory stimuli, but their music perception is better than the former. Secondly, improvised music is linked to children's inner interests. Such therapies can concentrate and participate in the treatment by attracting the attention of children's patients. In this kind of treatment, the patient's emotional synchronization is improved, which involves the increase in the frequency of participation in sexual behavior. The active and active participation behavior it produces is a very rare recovery symptom in autistic patients, which is of great clinical significance. At the same time, the study provides an important therapeutic perspective for autism, and non-guided treatment activities can often promote more active willingness to participate for autistic children, and the frequency of positive emotions will be higher. Therefore, in the early stage of treatment, it is very important to let the child dominate the activity.

Similarly, research on improvisational music therapy has opened new perspectives for future treatments of autism, highlighting the need to further investigate the mechanisms of this therapy by comparing tuning-based and non-tuning approaches. Many studies on improvisational music therapy, however, suffer from insufficient sample sizes. For instance, Nordoff and Robbins utilized improvisational techniques involving drum/cymbal, piano, and vocal interactive activities, showing progress in areas such as increased vocabulary, development of spontaneous and communicative language, conversational skills, and adaptability to changes and new situations.

Although numerous case studies have demonstrated the therapeutic benefits of creative music therapy, no controlled experiments specifically focusing on improvisational techniques within creative music therapy have been conducted. Additionally, these studies often fail to account for the variability in patients' physiological conditions (e.g., asynchronous neurological impulse conduction, deficits in emotional expression, and communication abilities), which limits the ability to definitively prove the efficacy of improvisational music therapy. Further research and systematic evaluations are required to confirm its effectiveness.

4. Summary

In conclusion, this article introduces two branches of music therapy for autism spectrum disorder and analyzes their research processes and therapeutic effects. It highlights the clinical significance of these therapies, their potential to guide future in-depth research, and the limitations posed by small sample sizes, which reduce the persuasiveness of current findings. These treatments are effective in promoting emotional expression, increasing the frequency of active participation, developing social skills, and fostering positive emotions that support recovery. However, these therapies primarily address psychological disorders related to external interactions, leaving gaps in improving language abilities and the processing of visual information. Future research is needed to explore treatment methods that can better address issues such as asynchronous neurological impulse conduction, delayed response times, and communication barriers.

Authors Contribution

All the authors contributed equally and their names were listed in alphabetical order..

References

[1] Zeidan J, Fombonne E, Scorah J, et al. Global prevalence of autism: A systematic review update. Autism Res, 2022, 15(5): 778-790.

[2] Wing L, Gould J, Gillberg C. Autism spectrum disorders in the DSM-V: better or worse than the DSM-IV?. Res Dev Disabil, 2011, 32(2): 768-773.

[3] Mandy W, Lai MC. Annual Research Review: The role of the environment in the developmental psychopathology of autism spectrum condition. J Child Psychol Psychiatry, 2016, 57(3): 271-292.

[4] Tager-Flusberg H. The origins of social impairments in autism spectrum disorder: studies of infants at risk. Neural Netw, 2010, 23(8-9): 1072-1076.

[5] Myers SM, Johnson CP; American Academy of Pediatrics

ISSN 2959-409X

Council on Children With Disabilities. Management of children with autism spectrum disorders. Pediatrics, 2007, 120(5): 1162-1182.

[6] National Center on Birth Defects and Developmental Disabilities. What is Autism Spectrum Disorder? Centers for Disease Control and Prevention. 2020.

[7] Thompson GA, McFerran KS, Gold C. Family-centred music therapy to promote social engagement in young children with severe autism spectrum disorder: a randomized controlled study. Child Care Health Dev, 2014, 40(6): 840-852.

[8] Kim J, Wigram T, Gold C. Emotional, motivational and interpersonal responsiveness of children with autism in improvisational music therapy. Autism, 2009, 13(4): 389-409.