

Music as a Language: Assessing the Extent to Which Active Music Therapy Promotes Socialization Development for Children Under 12 with Down Syndrome

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ABSTRACT

The number of children in western countries diagnosed with Down syndrome (DS), a disease caused by chromosomal abnormalities, is still increasing. The resulting delayed cognitive development also leads to deficits in social functioning in children under 12. Active music therapy (MT), as a natural intervention to achieve therapeutic functions through improvisation, performance, and singing, has been proven to promote the socialization development of children with DS. To get a better idea of the extent of the promotion and exactly what aspects it has improved, I conducted literature reviews and interviews with a music therapist. The results suggest that active MT can stimulate the socialization development of children under 12 with DS in three aspects: language skills, social-emotional development, and pro-social behavior. Although the improvement effect of active MT is better than that of passive MT, it requires the client to have a basis of music theory, that is, it requires higher requirements on the client, so the treatment method should be selected according to the severity of the client's DS or a combination of the two. Hence, future research could be aimed at finding the simplest interventions with sufficient client engagement and verifying the continuation of the effect of active MT.

Introduction

Music is the art of time with organized sound movement, with a fixed period of time covering changes in melody and rhythm. People have tried for a long time to find the relationship between music and people's inner world. Music Therapy (MT) is a systematic intervention process in which the music therapist uses various forms of musical experiences, as well as the therapeutic relationships that develop as the driving force of therapy to help the patient achieve health goals. It can be divided into two types according to the participation form of the client: active and passive. As shown by figure 1, the active MT discussed in this paper mainly adopts singing, instrumental performance, composition, lyric creation, and improvisation, while in passive MT, clients listen to, discuss and accept musical stimulation. It has been proven to be effective for clients with neurological disorders (Canicio, Guardiola, and Moreno 2017; Raglio et al. 2015) and autism spectrum disorder (Foley 2017; Gold, Wigram, and Elefant 2006). For example, in September 2022, I established a MT club in my school and held some MT courses for 7 autistic children. Through singing their favorite songs with them and teaching them to play kalimba, I noticed their increased engagement and willingness to speak.



Figure 1. Direct Difference between Active MT and Passive MT.

Down Syndrome (DS) ¹, which is caused by the presence of an extra copy of human chromosome 21, is a genetic disorder that affects approximately 1 in every 700 births, making it the most common chromosomal disorder. DS is characterized by intellectual disability, physical growth delays, distinctive facial features, as well as difficulties in socialization (Desai, 1997; Malak et al., 2015). Children with DS often face challenges that impact their social skills and their ability to communicate effectively with others. Traditional therapeutic interventions for children with DS often focus on speech and language development, occupational therapy, and physical therapy (Davis, 2008; Ruiz-González et al., 2019). While these interventions are essential, they may not fully address the socialization needs of children with DS. Therefore, there is a need to explore alternative therapeutic approaches that can effectively promote socialization skills in this population. This paper will explore the use of active music therapy as a means of promoting socialization development in children under 12 with DS.

Background

Music Therapy

In clinical therapeutic activities, the biggest difference between MT and any other kind of therapy is that music therapists use music as their basic therapeutic medium. They use musical activities to achieve therapeutic goals, making the music and the therapist complement each other.

MT is a scientific systematic treatment process, not a simple, single, random, and unplanned music activity. In the clinical practice of music therapy, a music therapist must complete three stages of work in a rigorous procedure: assessment, intervention, and evaluation. In the assessment stage, the therapist assesses the problems, conditions, symptoms, and even the growth process of the client, and proposes long-term goals, short-term goals, and treatment plans based on the results of the evaluation. In the intervention stage, the therapist uses various means according to the long-term and short-term treatment goals to promote the client to change in line with the treatment goals. During the evaluation phase, the therapist determines whether the previous intervention achieved the desired outcome (Gao, 2020).

In MT, music therapists use two factors simultaneously to promote therapeutic change: the musical experience and therapeutic relationship. These two factors are mutually influencing and interdependent. Therapeutic relationships in MT are complex and diverse, and these relationships may be musical, physical, spiritual, behavioral,

¹ “Active vs. Passive Music Therapy” Music Heals, updated January 31, 2023, https://twitter.com/musicheals_ca/status/1620467318915473413

social, or psychological. However, the most basic relationships are the relationship between the subject and the music and the relationship between the subject and the therapist (Gao, 2020).

Down Syndrome's Social-related Symptoms

Children with DS under the age of 12 develop language at a slower pace than normal children due to inadequate cognitive skills. According to Pienaar (2012), "Children with DS have difficulties with auditory perception and processing, articulation problems, and difficulty learning language rules" (p. 37). They are late in saying their first words, about 18 months, and their vocabulary grows more slowly than in ordinary children (Buckley, 1993). Their vocabulary skills develop more quickly than grammar skills, as shown by their difficulty in sequencing words and their tendency to omit verbs and functional words (Buckley, 1999; Pienaar, 2012). The speech problem in children with DS under 12 is also a contributing factor to underdeveloped language skills. These speech problems are caused by congenital differences in vocal tract structure and frequent periodic hearing loss due to frequent otitis media.

Children under 12 with DS are more willing to interact and communicate and show strengths in gesturing than children without DS. They pay more attention to people and respond atypically to communications. In the process of therapy, their answers to questions may have nothing to do with the questions themselves; their eyes may wander around; they may be immersed in their own world; it may be difficult to switch and maintain attention; and they may talk to themselves. In this case, therapists often need to follow their topics and continue the conversation with them (Buckley, 1999). Besides, in social interactions, they may also have behaviors that are inappropriate and unacceptable. Such an abnormal way of dealing with interpersonal relationships can further lead to externalizing problems, "such as maladaptive behavior and antisocial behavior" (Barati et al., 2012), and internalizing problems, "such as lack of confidence, anxiety, and depression" (Barati et al., 2012).

Socialization and Down Syndrome

Socialization is a fundamental aspect of human life, and children under 12 with DS are no exception. It enables them to develop essential social skills, such as sharing, taking turns, and cooperating with others. Socialization also helps children under 12 with DS to build friendships, develop a sense of belonging, and enhance their self-esteem. Individuals with strong social skills have better mental health and higher academic achievement. The significance of socialization development for children under 12 with DS is mainly reflected in three aspects: 1) Through socialization, they can build a positive self-identity, develop a positive view of themselves, and improve confidence and self-esteem. 2) Socialization helps them build connections, and thus better adapt to the social environment. It gradually expands their social sphere from their therapists to family members to the community. 3) Building social support networks, increased sense of well-being, and reducing feelings of isolation and depression. Children under 12 with DS often face challenges in socialization due to cognitive and language delays, physical limitations, and difficulties in understanding social cues. These challenges can lead to social isolation, limited communication, and reduced opportunities for inclusion in mainstream environments. It is crucial to address these challenges and provide appropriate interventions to enhance their socialization skills.

Methodology

Due to the severity of COVID-19, I was unable to participate in a formal music therapy session; thus, I mainly used literature review and interview as my research methods. Sources of literature review include Pro-Quest, PubMed, JSTOR, Google Scholar, and Journal of Music Therapy. Considering the timeliness and pertinence of my research, I chose to restrict the start date of the literature around 2000 and to include groups with Down syndrome no older than 12 years of age. Meanwhile, research of MT are slightly different between countries due to cultural elements, so the

authors of references were mainly from European and North American countries. Keywords used to search the corresponding literature were “music therapy and Down syndrome”, “socialization”, “Down syndrome”, “social behavior”, “social-emotional development”, and “musical play”. Since socialization development was expressed differently in literature, I classified and summarized the factors that affect socialization in children with DS under 12. In addition, I invited Hongyu Chen, a master student of music therapy at Montclair State University and a music therapist, as the interviewee. He graduated from the Central Conservatory of Music. He has practiced music therapy at the International Brain Research Center, the Seasons Hospice & Palliative Care, the Oncology and Gastroenterology Department of Peking Union Medical College Hospital, and the Beijing Our Home Special Children's Center. He once worked in the special needs children's institution for one year and has been in contact with some children with DS. Questions asked during the interview: 1) Please describe any active music therapy methods that you use. 2) What social skills are you hoping will improve in children with DS following music therapy? 3) For children under 12, which age do you think is most responsive, and how do the children benefit? 4) Please describe any particular challenges doing music therapy sessions for children with DS.

Discussion

To explore the various changes in the socialization of children under 12 with DS before and after receiving active MT, I referred to previous research and organized expert interview. Active MT is a non-invasive and engaging means of promoting the socialization development of children under 12 with DS in three aspects: language skills, social-emotional development, and prosocial behavior. The demonstration in this section will relate to the impacts of active MT from these three perspectives.

Language Skills

Music and language complement each other, and some of their laws are in common. In any learning process, including language learning, repetition helps people acquire information. Children are unaware that they are repeating some words over and over again. Even fetus can absorb the musical qualities of language that it hears through its mother's body: the tone, rhythmic patterns, melody, tempo and dynamics (Wylie, 2006). Music evokes emotions and engage individuals on an emotional level. Emotional engagement can enhance motivation, attention, and memory, which are important for language learning. According to Barker's study in 1999, singing provides children with DS with a more enjoyable way than speech alone does. Apart from that, the flow of the music is often enhanced by the flow of the music, because the division of sentence components in lyrics is often the same as in everyday communication. The combination of melody and lyrics enables children under 12 with DS to construct the phrases and sentences they are using, making the syntactic structure more memorable. In other words, the process of placing words into rhythmic patterns enables them to develop a slightly different skill, essential for singing and still reinforcing their use of language (Barker, 1999). Active MT also encourages children to express themselves through singing, improvisation, and songwriting. This creative expression can enhance their expressive language skills and promote self-confidence in communication. On the other hand, active MT provides opportunities for children to listen and comprehend song lyrics and verbal instructions. This can enhance their receptive language skills, including understanding grammar, syntax, and comprehension of spoken language. Furthermore, active MT enhances children's phonological awareness², for they have to sing every syllable with musical notes. There is a connection between music and eurhythmy³: music increases the vocal production of teenagers, integrating a vocal and rhythmic response (Loewy, 2004). The musical experience was associated with an improvement in psycholinguistic skills such as comprehension, auditory association, verbal expression, and verbal memory in children under 12 with DS.

² Phonological awareness is the recognition that words have constituent sounds.

³ Eurhythmy means rhythmical movement.

Not only can active MT play a stimulating role, but it can also promote language development in children with DS from a physiological perspective. Singing and playing instruments require greater mouth movement and better articulation (Barker, 1999). The rhythmic structure of music can improve oral motor skills, leading to improved articulation and speech clarity in children with DS. Singing and vocal exercises in active MT can strengthen the muscles involved in speech production (Gemma et al., 2020). Additionally, active MT can help children with DS synchronize their movements and gestures with the beat (Pienaar, 2012). This synchronization can enhance their motor skills, including oral motor skills, which are crucial for speech production. Moreover, music provides auditory stimulation that can enhance auditory processing skills. Children with DS often have difficulties in auditory processing, and active MT can help improve their ability to perceive and discriminate sounds, which are essential for language development (Barker, 1999).

Social-emotional Development

Specifically, joint musical improvisation, which is the group form of active MT, is mainly aimed at cultivating qualities that children under 12 with DS themselves need to socialize. It increases children's emotional sensitization, meaning that their own personalities will be enriched. Moreover, there are some social and emotional components contained in the long-term artistic competencies (formed by joint MT sessions) such as the development of emotional self-regulation, responsibility, empathy, self-expression, and self-criticism, and thus enhances children's cooperation skills, confidence, and sense of group belonging. They will be more willing to participate in social activities and promotes their acquisition of values. In general, joint MT sessions promotes children's social-emotional development based on The Prism Theoretical Model of Social-Emotional Learning: the first level is social and emotional skills such as emotion knowledge and self-regulation; the second level presents indicators of social success, which means, in particular, improvising or performing a complete piece or song and maintaining healthy relationships with peers and adults; and the third level is related to social competence, meaning to effectively and positively interact with others.

Furthermore, group active MT enhances the connection between children with DS and the external world. In the infancy stage, along with the recovery of cognitive function brought about by musical acquisition, social interactions of infants with DS are also improved, especially those between infants and parents (Gerry et al., 2012; Wylie, 2006; Bradford, 2021). Positive communication between parents and infants promotes the acquisition of earlier use of prelinguistic communicative gestures (Gerry et al., 2012). The parent-child relationship is the basis for more complicated social relationships in the future. Joint MT sessions establish social relationships, maintain social bonds, and build trust between clients through collective production (Váradi, 2022). Research shows that in the experiment, subjects who sang in a group scored higher on the measure of trust than those who engaged in nonmusical activities such as reading poems (Váradi, 2022). According to MacDonald (2013), "Musical improvisation provides opportunities for negotiating differences through creative collaboration and understanding the unique musical, mental, individual and social processes" (p. 10). Thus, children under 12 with DS who are relatively cognitively functional will have less conflict with children around them than those who don't attend group MT sessions.

Prosocial Behavior⁴

Several studies have shown that active MT enhances children's prosocial tendencies towards the interaction partner. Active MT session provides a safe and non-threatening environment for children under 12 with DS to express and regulate their emotions. Music has the power to evoke and amplify emotions, allowing children to explore and express their feelings through various musical activities. Through active engagement in music-making, children can learn to

⁴ Prosocial behaviors are those intended to help other people. These actions are characterized by a concern for the rights, feelings, and welfare of other people. Behaviors that can be described as prosocial include feeling empathy and concern for others.

identify and regulate their emotions, leading to improved emotional well-being and self-awareness, which results in a concomitant reduction in antisocial behaviors. Specifically, joint musical activities need joint attention and coordination to achieve the shared goal of making music, which may create a stronger sense of commitment (Buren et al., 2021). The joint music-making process creates the periodic pulse, which contributes to the synchronization of children's body movements. This has been proven to produce positive feelings that weaken the boundaries between themselves and the group, and thus strengthens group trust, social cohesion, and sympathy (Kirschner, 2010; Schellenberg et al., 2015). Moreover, this similarity of movements between children might give rise to prosocial reactions such as helping behavior and attention to others' needs. Hence, active MT should be considered to have a prosocial effect on children under 12 with DS.

Interview

During my research process, since the interviewee led real MT sessions previously, his feedback is worth considering when determining whether active MT can promote the socialization of children under 12 with DS. It has been proved that results of his practice are consistent with my hypothesis. Hongyu Chen mentioned a case of a 12-year-old boy with DS. At the beginning of treatment, he was relatively shy, looked away, and often did not respond. For children with Down syndrome, parents often choose to keep them at home or in special education schools, where they do not have much contact with the outside world, which leads to shyness and fear about socializing with strangers, so there will be some difficulties in communication at the early stage. First, a personal assessment is made of the client in terms of physical, emotional, social, and verbal aspects. Secondly, the intervention plan is developed by the music therapist, which clarifies the long and short-term goals. There is no specific kind of music for children with DS, and music can only be selected according to their personal preferences. Then, music therapists should make further contact with children in the way of music composition to establish a more harmonious relationship, which is important. Hence, another challenge is to establish his connection to the music and the relationship between the music therapist and him. This is a gradual process, and there may not be a lot of interaction in the first five sessions, which requires long and short-term goals and cognitive and social interventions based on his step by step changes. This child gradually made more eye contact with the therapist, was more willing to speak, and had improved language skills. Generally, it takes 10-20 sessions to see children's improvement.

Limitation of Active MT and Recommended Approach

As mentioned in the introduction, active MT requires clients to participate in music creation, such as singing and playing instruments, so the requirements for their musical capacity will be relatively strict. Clients with no basis in music theory do not respond well to active music therapy, though research shows that active MT leads to a substantially more positive outcome than passive MT does (Buren et al., 2021), as shown by figure 2. Meanwhile, the severity of cognitive deficits in children with DS also affects the intervention of MT. For children with serious cognitive and intellectual problems, it's reasonable to use passive music therapy. Conversely, as for those who with DS in the early stage or mild DS, a combination of passive and active MT can be used.

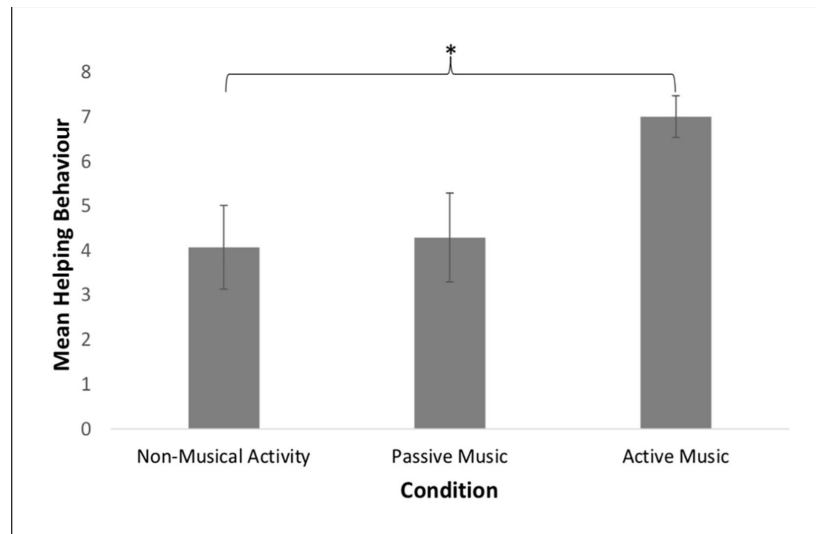


Figure 2. Mean helping behavior (a kind of prosocial behavior) across three conditions (Buren et al., 2021)

Conclusion

DS, which derives from the trisomy of human chromosome 21, is characterized by growth deficiency, mental deficiency, and nervous system anomalies, making patients' socialization development lag behind that of ordinary people. Children under 12 with DS often have a passive style of interaction with the environment. For example, they may have difficulties with clear word production and maintaining attention, struggle with grammar, and interact with others with little eye contact. As an art form of social non-verbal communication, music has proven to be an effective intervention for people with DS. Specifically, active MT is a medium to support the expression of emotions and ideas and an engaging, multisensory social activity; it provides improvisational communication through music. Therefore, language skills, social-emotional development, and prosocial behavior are enhanced by active MT among children under 12 with DS. Although active MT has a promoting effect on the socialization development of these children, such influence is individualized and will be different due to children's personalities, growth experience, and severity of symptoms. Some children may progress significantly in 10 sessions, but it may take 20 sessions before others can make eye contact with music therapists.

Based on the high demands of active MT on clients' abilities relative to passive MT as stated above, future research could measure and compare the effectiveness of different instruments or different methods of music creation for active MT in children with DS, to identify the easiest for use and ensure their participation in music creation. Additionally, the long-term effects of active MT on the socialization of children with DS are worth exploring. Follow-up assessments conducted several years after the intervention can provide insights into the sustainability of the intervention's effects and its impact on the overall development of these children.

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