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An Analysis of Music Therapy on Improving Social and Communication Skills in Children with Autism Spectrum Disorder

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An Analysis of Music Therapy on Improving Social and Communication Skills in Children with Autism Spectrum Disorder

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Introduction

Autism, a diagnosis that has skyrocketed and is worrisome to parents, teachers, clinicians and researchers. Over the past four decades, the rate of children suffering from Autism Spectrum Disorder has grown 10 times and is the fastest growing disability in the US.[1,2] Currently, 1 in 68 births are affected by Autism.[1] Due to the high prevalence of this disability, researchers are searching for ways to treat the symptoms of this incurable disorder. Music therapy is gaining popularity as an intervention strategy for children with Autism Spectrum Disorder (ASD).[3] This paper will analyze the benefits music therapy has on the improvement of social skills and communication in children with ASD.

Autism

Autism Spectrum Disorder (ASD) is a prevalent neurodevelopmental disorder that is defined in the Diagnostic and Statistical Manual of Mental Disorders (DSM-V) characterized by "persistent deficits in social communication and social interaction across multiple contexts, including deficits in social reciprocity, nonverbal communicative behaviors used for social interaction, and skills in developing, maintaining, and understanding relationships."[2,4] Additionally, patients with autism can present with the following symptoms: little interest in making friends, lack of eye movement, loss of language and repetitive play with select items.[5]

Autism Spectrum Disorder Diagnosis

The diagnosis of Autism Spectrum Disorder is only made after other diseases and disorders are ruled out. Currently, no diagnostic tests are available to diagnose Autism.[5] Autism Spectrum Disorder is diagnosed after concerns of developmental delay are presented to a physician by a concerned parent. After evaluation by a physician a diagnosis is then made by a

specialist using ASD criteria and the symptoms the child presents with.[5] The severity of the disability is dependent on the presenting symptoms at the time of evaluation.[5]

Treatment of Autism Spectrum Disorder

Treatment of ASD is difficult due to the spectrum nature of the diagnosis.[4] Many treatments are aimed at treating symptoms. These treatments have differing amounts of proof for their safety and efficacy. Treatments can include healthy lifestyle choices, restrictive diets for GI symptoms, applied behavior analysis and parent-implemented training.[6] The only two medications approved by the FDA for the treatment of aggression, tantrums and prevention of self-injury in ASD are Aripiprazole and Risperidone.[6] These medications are reserved for severe symptoms and are linked to the following side effects: weight gain, dyslipidemia, hyperglycemia, sedation and tremors.[6]

Music Therapy

According to the American Music Therapy Association (AMTA), music therapy is defined as "the clinical and evidence-based use of music interventions to accomplish individualized goals within a therapeutic relationship by a credentialed professional who has completed an approved music therapy program."[3] Enhancement in communication skills is one of the major outcomes of music therapy listed by the AMTA.[3]

Children with ASD have been found to attend more to auditory than visual cues when the auditory stimulus is musical.[3] Research has shown a unique attraction to musical stimuli and enhanced music ability in people with ASD.[4] Due to these attractions and abilities, music has been theorized to promote language development.[3] Additionally, the structure of music provides

cues to help children with ASD to organize, predict, and respond which can help facilitate social interactions and waiting/impulse control.[4]

Background

Music Therapy Intervention Used to Improve Social Skills

Children with ASD have varying difficulties with social interaction. These difficulties can include poor social and emotional exchange, turn taking and reduced eye contact during social exchange.[4,7] Various music therapy approaches can help children with ASD improve their social skills. A common theme between approaches is the use of musical stimuli and musical engagement to provide the building blocks for improved socialization.[4] As stated earlier, children with ASD have a different neural organization than others and have stronger activation of specific brain centers when exposed to song.[8] Additionally, children with ASD respond positively and enjoy musical experiences.[2,4] Music therapy interventions improve engagement behavior, emotional engagement, and social interaction.[4]

One music therapy approach called Family-Centered Music Therapy shows that music therapy improves social interactions in children with ASD. This parallel randomized controlled study was implemented in the home of 23 children with severe ASD.[9] The music therapy was in addition to their early intervention program. One study group had the intervention of music therapy and the other group just the early intervention program. The therapy included the child, a parent and a music therapist. Therapist observational assessments and parental interviews were completed to measure interventional responses in the home and community. The outcomes showed that a Family-Centered Music Therapy program improved social interactions in the home and the community.[9] Improvements in response to others, imitation skills, sharing, co-

operating, and playing with others were noted.[9] Additionally, an improvement in interpersonal engagement was also seen.[9]

Two other studies show that music therapy improves social skills using different musical techniques. The first study, an experimental study, used musical activities based on Orff-Schulwerk where they used music listening, singing of songs and chants, clapping, movement and dancing, special music of Orff-Schulwerk and instrument playing to help improve social skills.[2] Results were measured using the Social Skills Rating System Scale for the Parent (SSRS-P). The second study, a review article, reviews music and movement therapies or music-based intervention outcomes to demonstrate the positive impact music therapy has on social skills. Additionally, they reviewed changes in brain imaging studies to support their claims for the use of music-based therapy.[7] Both studies conclude that social skills in children with ASD are improved when music-based therapy is implemented as an intervention.[7,8] Furthermore, both therapies were conducted in a group setting. In these group musical settings, children learn imitation, turn taking, joint attention and empathy from other children. Overtime the child will understand their partner's intentions and emotions.[7]

Lastly, a randomized controlled study by A. Blythe LaGasse, studied the effects of music therapy on children with ASD in the age ranges of 6 to 9.[8] The study looked at joint attention, eye gaze, and communication changes between a group that received music therapy and another group that received traditional group skills training. Twenty-two children engaged in the music therapy intervention for ten, 50- minute sessions over a five-week period.[8] The results were measured using the Social Responsiveness Scale, the Autism Treatment Evaluation Checklist and video analysis of the sessions.[8] The findings of this study concluded that music therapy improves joint attention with other children and improves eye gaze.[8]

Music Therapy Intervention Used to Improve Communication

With the increasing number of children being diagnosed with Autism, there is an increase in children with speech delays and children that are nonverbal.[10] Music therapy's ability to hold the attention span of children with Autism comes from the patterns of the music and is thought to be the reason for improvement among ASD children.[3] However, studies contradict the benefit of music therapy intervention for the improvement of communication skills.

The use of music therapy to improve communication or to prompt communication in non-verbal autistic children was not found to improve speech over traditional therapies. In a pilot study conducted by Sandiford et al, it was found that the use of Melodic Based Communication Therapy improved the number of verbal attempts faster than that of the normal speech and language therapy offered.[10] However, at the conclusion of the study, it was found that there was no difference in verbal attempts or correct words between the two groups after musical therapy treatment concluded.[10] Nevertheless, the Melodic Based Communication Therapy study did conclude that new words were heard in the home environment by parents and the children had more imitative attempts at speech than the speech and language therapy group.[10] A randomized controlled trial conducted by A. Blythe LaGasse, as mentioned above, also found no improvement in initiating or responding to communication within the music therapy treatment group.[8]

In contrast to the studies that discounted the use of music therapy for improved communication, two studies, a Cochrane Review and a narrative review, both concluded that there were positive improvements in communication. The Cochrane Review stated there were "small to moderate effect sizes result for the primary outcome of verbal communicative skills."[11] The Narrative Review conducted by Simpson and Keen found that in music therapies where the

words were sung or used within a song, those words were correctly imitated and the child was more attentive during music.[12] Additionally, they found that the use of improvisational music therapy increased musical and nonmusical communicative behaviors.[12]

Length of Music Therapy Effects on Improving Communication Skills

The amount of time exposed to a music therapy program also seems to play a role in the success of improved communication skills in children with ASD. Research has found that prolonged music training not only improves musical perception but also speech perception and expressive/receptive language.[7] In a study using *Voices Together*, a music-based classroom-based intervention used for improving communication, two groups of autistic children were exposed to the music therapy intervention.[3] One group received 7 weeks of therapy and the other group 15 weeks. At the conclusion of the study, improved verbal responses exhibited positive results in the therapy group where 8 more weeks of therapy was administered.[3] "Preliminary findings suggest that music therapy delivered in a classroom setting in 45-minute weekly sessions for 15 weeks can promote improvements in verbal responsiveness among individuals with autism."[3] "Due to introductory nature of this finding, more research is needed on classroom-based music therapy and on the intervention time benefit of music therapy."[3]

Type of Music Used to Benefit Social and Communication Skills

In addition to multiple music therapy programs that improve social and communication skills in children with Autism Spectrum Disorder, the rhythm/melody of the music used during the therapy also plays a role in their improvement. Due to the neural differences mentioned earlier in this paper, children with autism have difficulty recognizing emotions conveyed through speech.[7] However, they can recognize these emotions through music.[7] Anger, happiness, sadness

and fear can all be communicated through the music's tempo and/or sound level which can then facilitate social connections with others.[7]

The concept that a particular rhythm or song can improve social or communications skills can be seen in a study that looks at the intervention of *Voices Together*. In this study three songs were used to elicit improved verbal responses.[3] However, when the data was analyzed it was found that only two of the three songs actually showed significant improvement in the level of response.[3] The third song, topic song, did not show improvements in either test group.[3] The researcher suggests the lack of response to this song was due to the difference in musical pattern compared to the other two songs that showed improvement.[3]

Two types of music therapy approaches are used for language improvement and social engagement. "Auditory Motor Mapping Training improves word articulation by training an association between self-produced sounds and auditory-motor mapping."[7] Research has shown that non-verbal children with ASD showed an improved ability to make words and phrases following 8 weeks of this type of therapy.[7] The second type of music therapy is called Improvisation Music Therapy. This approach is individualized to enable social engagement and verbal/nonverbal communication.[7] This approach was documented in a review article by Simpson and Keen where improvisation music therapy technique was seen to increase musical and non-musical communicative behaviors in children ages 6-9.[12]

Methods

A thorough search of PubMed was completed between the dates of May eighth through June eighth to gather research for this paper. Keywords that were used as search criteria are as follows: 'Autism', 'music therapy', 'music therapy and social skills', 'Autism treatment music

therapy' and 'Autism communication music therapy'. Articles were included if they met the following criteria: (1) Articles were published within the past 6 years, (2) Included studies of music therapy and its benefits, (3) Included background information on what music therapy is and what autism is, (4) Articles that were peer reviewed articles, randomized controlled trials, or meta-analyses. Once articles were selected from inclusion criteria, the abstracts were then read. The articles that met the criteria were read and analyzed in their entirety for selection. Finally, articles were chosen for inclusion in this paper.

Discussion

The goal of this research was to analyze the positive effects that music therapy has on the treatment of social skills and communication in children affected by Autism Spectrum Disorder. The research shows that many different types of music therapy programs do provide improvement for social skills which include improvement in eye gaze, joint attention, sharing, turn-taking and interpersonal engagement. However, research also showed contradictory evidence on whether music therapy provides improvements in communication which can be described as word imitation, verbal attempts, increased ability to make words and phrases, improvement in verbal responses and speech. Even though these results can be considered positive, we must step back and look at the sample sizes of these studies. The sample sizes for the study groups were small.[2,8,19,10,11] This could influence the statistical significance of the results reported. To strengthen these studies, more randomized controlled trials targeting each group of autism (mild, moderate and severe diagnosis) needs to be performed with a larger sample size. In addition, each music therapy program should also be assessed in randomized controlled trials to determine which program has the best benefit for the improvement of social skills and communication in these children. Furthermore, ages of participants were usually less

than nine years of age and in this research no children were in the adolescent age range.[12] If we say that music therapy is beneficial for the improvement of social skills and communication, we should also include adolescents to see if music therapy improves their communication and social skills as well. Otherwise, we could only conclude that music therapy is beneficial in children. Further research should explore the use of a wide age range of children to assess the benefits of music therapy across the developmental span.

Further development is also needed in the use of assessment tools to identify improvement in the areas of social skills and communication.[7] There were a wide array of assessment tools used to measure improvement in these children. Most of the assessment tools were surveys/checklists that were conducted by the parents of the children or the therapist/teacher. These types of measurement tools may not accurately show changes that are occurring within the music intervention.[4] In other studies, social skills such as eye gaze and joint attention were assessed using video recordings taken during the therapy session. Only one study talked about music related assessment techniques which included the Music-based Autism Diagnostics and Individual Music-Centered Assessment Profile for Neurodevelopmental Disorders.[4] I feel it is important to develop more concrete assessment techniques to be able to measure social and communication skills. One study mentioned they paid some of the teacher's money to fill out the evaluation survey.[3] This type of compensation could lead to falsifying evaluations. In addition, if the parent is filling out the survey, they may want the child to look like they are progressing in the music therapy program and may not be completely truthful in their answers leading to unintentional bias.[4] Inaccurate survey responses could lead to research results that are not accurate. By developing more concrete and consistent assessment techniques across the music therapy profession, the research results would be stronger.

It is also important to look at the benefits of how long the music therapy program is administered. Throughout the research there were large time range differences between studies. Only one study talked about the effect the length of the program had on the children. Longer therapy duration seems to have better outcomes than shorter therapy.[3] In this study, they found that the 15-week music therapy group had improved communicative response compared to the group only receiving 7 weeks of therapy.[3] This should be an area of focus in further randomized controlled trials. Additionally, there should be studies conducted at time intervals after the end of therapy to see if children maintain, improve or regress in their social skills or communication.

Lastly, not all studies mentioned the level of severity of autism diagnosis in their study design. A few of the studies looked at those diagnosed with severe ASD and others looked at moderate and mild diagnoses. The research shows that children diagnosed with mild or moderate ASD responded to therapies for communication and social skills. However, children diagnosed with severe ASD did not improve in communication with music therapy intervention. This brings up the question, is there a point in ASD severity where music therapy will not work or will be less effective? This also brings up the idea that music therapy may not be the actual variable that is causing the positive affects seen in this research. Some of the articles that were reviewed added music therapy on top of traditional speech and social/play therapies. Could there be another variable that is producing the positive effects seen in this research? Further research should be done to address these issues.

Conclusion

Music therapy may improve communication and social skills in children affected by Autism Spectrum disorder. The current research does show some positive outcomes with the use of music therapy as an intervention. However, while music therapy does show promise, I don't

believe that we can for certain say that music therapy is causing the change in these children. It is seen that children have a positive reaction to music so I don't see the harm in using music therapy. Music therapy does not have any ill side effects like some of the mediations used to treat symptoms, so I think it is acceptable to try music therapy as the research is showing that some children are seeing a benefit. Nevertheless, more research needs to be done to conclude that music therapy in fact does provide improvement in these areas. Research should be focused in the areas of specific autism spectrum disorder diagnosis with larger age ranges among participants, larger randomized controlled trials, longer duration of time children are exposed to the therapy, focusing on specific types of therapy songs/programs and lastly, more concrete and consistent assessment techniques need to be used to assess the improvement of children in music therapy programs.

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