2023

The Effects of Music Therapy on Autistic Students: A Literature Review

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THE EFFECTS OF MUSIC THERAPY ON STUDENTS WITH AUTISM: A LITERATURE REVIEW

A MASTER'S THESIS

SUBMITTED TO THE FACULTY

OF BETHEL UNIVERSITY

BY

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IN PARTIAL FULFILLMENT OF THE REQUIREMENTS

FOR THE DEGREE OF

MASTER OF ARTS IN EDUCATION

AUGUST 2023

BETHEL UNIVERSITY

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August 2023

APPROVED

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Abstract

This paper examines music therapy and how the use of this intervention can help students with ASD. The literature review provides a brief history of Special Education and the perception of autism, and what defines the classification of autism. The author suggests music therapy yields diverse effects for individuals with ASD, including emotional regulation, improved social, and language skills. Group interventions exhibit long-term enhancements, and incorporating games facilitates effective emotional expression. Challenges exist in achieving behavioral, psychosocial, and language objectives, with individual interest emerging as a crucial factor in determining music therapy's effectiveness. Parents as primary caregivers collaborate with teachers and therapists, especially during assessments, to tailor interventions based on the child's developmental level and needs.

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CHAPTER I: INTRODUCTION

I have six years of experience as a special education teacher, during which I have had the opportunity to teach diverse age groups throughout my career. I have worked at a federal setting IV special education school, a center-based classroom in a high school setting, and am currently an elementary resource teacher, mostly working with 4th and 5th grade students. Through my personal experience as a special education teacher, I have experienced many complex and extreme behaviors. One of my many jobs as a special education teacher is to teach my students how to regulate their emotions in the general education setting. In teaching, there are many obstacles that we need to overcome, and we do not always know what the best solution is to a problem. This is why we place our trust in research and evidence-based practices to determine the most effective methods of teaching students with disabilities. Throughout my teaching career, I have found that there are many evidence-based practices that help students learn how to regulate their behaviors. One of the most beneficial practices that I have seen is the use of music therapy and it can help students who have autism regulate their behaviors, and increase their social and communication skills.

History of Special Education

Special Education got its start in 1970 after a lobby of parents, educators, and teaching organizations voiced concerns on how to provide equitable education for students identified with special needs across the United States. Prior to this time, students and adults with severe disabilities were served in separate settings and were not afforded the opportunity to receive services in a general education setting. Between 1970 and 1975, only one in five children with disabilities received services. Many states excluded

children who were deaf, blind, emotionally disturbed, or had an intellectual disability. Parents were told to consider keeping their child at home or placing their child in a residential school or state hospital for the insane. Minnesota had St. Peter's Hospital for the insane. Due to lobbying efforts and congressional approval, President Gerald Ford signed into law the Education for All Handicapped Children Act (EHA) (Public Law 94-142) on November 29, 1975. The EHA guaranteed a free and appropriate public education (FAPE) to each child with a disability, in every state and locality across the country. Students were provided special education services based on the special education category. Some referred to this as the "lawyer's employment act" since parents had the right to due process hearings when they did not agree with the IEP services and educational setting. In 1990, Public Law 94-142 was reauthorized and became known as the Individuals with Disabilities Education Act, or IDEA. It wasn't until the 1990 authorization act of IDEA that the categories of traumatic brain injury and autism were added as new disability categories. Today, IDEA encompasses 13 special education categories. During the 1990 reauthorization process, congress mandated that transitional services be added, and the Individual Transition Plan (ITP) became part of the Individual Education Plan (IEP). Transitional services can begin at age 14 and may continue until age 21, when students with disabilities meet the requirements for post-secondary education. In 1997, IDEA reauthorization set forth another requirement to improve results for children and their families by accessing general education settings. It also gave states the authority to expand "developmental delay" to include students up to the age of nine. The new authorization provided families and schools an opportunity to resolve disputes through mediation and conciliation. Special education laws have provided

safeguards for students and families. Special education has become one of the most litigated areas in education ("*A history of the individuals",* 2023).

Perceptions of Autism

Autism is not clearly understood or agreed upon and has gone through significant changes in the definitions and parameters that identify what autism really is. It continues to be an enigma to medical, psychiatry, therapeutic providers, educators, and to families when their child is identified as having autism.

Many different organizations have varying definitions of autism. A historical perspective by Rosen (2021) described autism as difficulties with social interactions and connectedness beginning at birth. Hans Asperger's (1944) reported similar behaviors with social difficulties and interests, but added good verbal skills. The addition of verbal skills caused much controversy which made it unclear how to diagnose autism. The DSM-5 (American Psychiatric Association's Diagnostic and Statistical Manual of Mental Disorders) and the ICD-11 (World Health Organization's International Classification of Diseases chapter on mental and behavioral disorders) have changed the category to ASD (autism spectrum disorder), resulting in more limiting criteria. The change led to anticipation that the number of individuals qualifying for autism would decrease. However, the rate of identification of autism has continued to increase. This may be due to broadened criteria and increased awareness of behavior, communication, and social interactions associated with the definition. State departments of education have differing criteria for identifying and serving students with autism. This has caused additional complexity when families relocate and are denied service because of differing criteria across state lines. Disagreements between groups of providers continue in diagnosing and

defining individuals with autism. Autism has been classified as a mental disorder by psychiatrists, while the autism rights movement and researchers identify autism as neurodiversity (human thinking and experience, with strengths, differences, and diversity in human thinking with strengths and weaknesses evidenced). There is no known cure or prevention for autism. There have been several notions about what causes autism and yet there are no definitive answers. What is known about ASD is that it is a neurodevelopmental disorder that presents differently from one individual to another. Autism is a complex disorder that may have several risk factors that contribute to the disorder. These factors can be explained through genomics (the study of a person's genes), prenatal and perinatal factors (factors during pregnancy or very early infancy), neuroanatomical abnormalities (brain-based abnormalities), and environmental factors (a person's exposure to chemicals or toxins prior to inception) (Rosen, 2021).

What is Autism?

Autism spectrum disorder (ASD) has had several names in the past, such as pervasive developmental disorder, Asperger's syndrome, and autism. Autism spectrum disorder is used because of the ASD individual's wide range of behaviors and varying developmental levels. To understand ASD, one needs to understand how ASD individuals perceive and make sense of the world they live in. Several therapeutic treatments have been used when working with ASD individuals. Studies have found that pairing music with routine activities in a familiar environment increased body awareness, coordination, and reduced anxiety. Music therapy has shown promising results as an effective strategy to improve behavior and communication skills with ASD students (Hourigan, 2017).

Theory of mind is a challenge for ASD individuals as they struggle to understand what others are asking of them, and often lack the ability to understand the beliefs and desires of others. For instance, if an ASD individual is asked where they would like to go fishing, they may respond by saying they want to go to the zoo. Additionally, theory of mind impacts interpreting the emotions of happy, sad, angry, or upset based on the body language or expressions of others. In exploring emotions, music therapy is helpful by familiarizing the ASD individual with different songs that correlate to specific emotions. One example would be the song "If You're Happy". This song would pair the emotions sung with an action and give options for expressing happiness.

Executive functioning and self-regulation skills are the processes for one to plan, attend to tasks, remember instructions, and know how to perform multiple tasks successfully. ASD students often do not have the skill sets to filter distractions, prioritize tasks, control impulses, or set and achieve goals. Executive functioning tasks can be taught using music by introducing drumming patterns or dance steps.

Central coherence is an ability to organize and assemble the details of an activity that has occurred, which ASD individuals usually struggle with. An example of this is when an ASD student watches a movie, they can likely recite the names and backgrounds of characters, without being able to retain specific facts about the movie's plot. They have concrete information, but the abstract or broader story concepts are missed and difficult for them to explain or understand. Simpson et. al (2009) completed a study that investigated the use of music to teach ASD children to learn and label animals and symbols to the song "Old McDonald." The study found that ASD children were able to increase receptive responses using interactive whiteboards while singing. Additionally,

one child was able to label the animal symbols on the PowerPoint and the interactive whiteboard with no sounds given. In another study Heaton et al. (2001) looked into how students with ASD used music to identify animals but looked more into how savants were able to identify animals with pitch tones. The students in the study were shown musical tones with pictures of animals. The students then gave those tones in random order and they had to point to the picture that matched with its animal. It was found that students with ASD were able to pair the animals and tones at a higher rate then the control group. With this finding it shows that students with ASD are able to process music at a better rate and they are able to learn skills more accurately when music is added (Heaton et al., 2001).

Individuals with ASD often have difficulty with joint attention (Simpson, et al. 2009), which is a person's ability to follow someone else's gaze, locate something by pointing a finger at it, understanding facial expressions, observing body gestures, and integrating these into meaningful communication. Music therapy could be used to improve joint attention by focusing on pointing, showing, and coordinating body language between the person and an object. Removing objects that are not being used in the activity may increase the ASD individual's ability to focus. One example is pairing music with rolling a ball back and forth between the therapist and the ASD individual, pointing (my turn, your turn), showing the action (rolling the ball), and coordinating body language (sitting on the floor) (Hourigan, 2017). The benefit of music therapy, in combination with understanding how to use strategies, may support an ASD individual's experience, improve areas of deficit, and provide support as they progress.

Why Use Music Therapy?

There are several different tools and interventions used to improve skills of students identified with ASD. Music therapy is an intervention used for ASD students that has shown promise in improving behavior, communication, and social skill learning. As an Evidence-Based Practice, music therapy has been shown to be an effective intervention documented by the collection of data reported in research. A review of these articles supports the use of music therapy as an intervention that provides positive changes. Eren (2017) defined music therapy as being composed of three different models of teaching to help students learn the skills that they need. These included: Behavioral Approach to Music Therapy, Sensory Integration Approach to music therapy, and Creative Music Therapy. Therapists and teachers decide which route is best for the student based on the student's developmental and educational goals. Kaplan (2005) surveyed parents to determine if they saw changes in their child's skills. The questionnaire revealed that parents agreed that music therapy had helped their children across all areas.

The favorable response of parents and caregivers lends further support that generalization or transfer of skills learned in music therapy occurred at home, at school, and in the community. Lygeraki's (2019) research revealed improvement and a transfer of skills in the classroom when intervention was started at a young age. Katagiri (2009) investigated music interventions using text and background music, which showed effective results in improving decoding and encoding emotions. Additionally, the research revealed that participants' understanding of the four emotions was greatly improved from pretest to posttest, with expressive skills showing the greatest

improvement. Hayoung (2010) investigated students who received both music and speech training, results demonstrated improvement in all aspects of speech production and communication skills. This outcome indicates that music perception is similar to how speech/language information is processed in the brain. This research supports the rationale of using music with children identified with ASD.

Definition of Terms

For the purposes of this review, it is important to understand music therapy and what happens in individuals with autism when they are involved in a music therapy session. As mentioned above, autism is not clearly understood or agreed upon and has seen significant changes in the definitions and parameters that identify what autism really is. A large number of studies talk about music therapy and the inventions that they use during a music therapy session. Music therapy differs from traditional music classes that are usually offered in the public school system. For this reason, music therapy will be defined as an evidence-based practice that is used to help individuals. During Music therapy, a session will include singing along, playing instruments, and at times composing music. This all depends on the individual that is having the session and the goals that they are trying to achieve. Music therapy can be broken down into three different types of therapies that include Behavioral Approach to Music Therapy, Sensory Integration Approach to Music Therapy, and Creative Music Therapy (Eren, 2017).

Research Focus

As the body of literature is reviewed, the questions that will help guide the research are: 1. How does music therapy help students with ASD? 2. What must parents understand about music therapy to help care for their children with ASD? Before using

Music therapy as an intervention the teacher should be sure that this is the best fit for the student and that research is up to date, since there are still new modes of research that are being developed and that music therapy is evolving and changing. It is important to update the research understandings we use because they have a significant impact on our students and their futures.

CHAPTER II: LITERATURE REVIEW

Chapter II reviews the published literature on using music as a tool to help students who have autism. It will examine the benefits and disadvantages of this instructional choice and discuss how these tools are used in the classroom to improve behaviors and speech for students diagnosed with Autism. This information will help in determining what model should be used in the classroom or if music therapy will help students become successful. This will also help parents who are struggling to decide what program would be beneficial in helping their children. The literature used in this thesis was located through searches of ERIC, EBSCO, and Google Scholar with publication dates of 1999-2022. These searches were narrowed using the following keywords: "Autism", "Music Therapy", "School", "Calming Strategies" and "Behavior."

Benefits of Music for Students with ASD

There are several strategies for helping students with autism spectrum disorder (ASD) in the classroom. Many students who have ASD struggle with social skills and being able to control their emotions. Students who have ASD may also struggle with bright lights, loud noises, unexpected situations, and have difficulty expressing their feelings appropriately. An array of strategies that are used by special education teachers can help students who struggle with ASD, in social situations, and being able to control their emotions. These strategies can be used in the classroom to help students with ASD become successful and become better students as they progress through the K-12+ educational curriculum.

How Does Autism Affect the Brain?

Understanding how the brain develops in early infancy and develops in adulthood influences the differences between typically developing individuals and individuals with ASD. An important aspect of the study was understanding that brain development depends on the interaction of two factors: one's genetics and environmental influences. This information is important because these factors begin building social information during infancy and continue to build a mature brain network. The information was obtained by comparing similarities between infants' and adults' processing of social situations. Neuroimaging methods (EEG, ERP, PET) were used to examine social perception in infant processing of social information. Grossman et al. (2007) observed how infants processed information related to face, gaze, emotions, recognizing familiar people, action, and joint attention.

One of the findings found early aged infants successfully discriminated between direct and averted gaze when encoding objects in memory. While the infants' cortical structures were only partially developed, similarities were found between adults and infants in processing social information. However, infant response was broader than adults who had developed specific skills in their response to social information. Another finding supports that the social brain network has more consistent processing of face, body, and actions. With experience, the structures become more specialized in their responses, resulting in patterns of activations typically observed in adults. This suggests that individuals with ASD experience atypical development, which leads to the failure or delay in the development of structures within the cortical social brain network.

Two notable research endeavors, conducted by Sparks et al. (2002) and Courchesne et al. (2011), have provided insights into the brain development systems observed in children with ASD. Sparks et al. (2002) focused on the specific gross neuroanatomic substrates of the brain developmental disorder. Their study involved three groups of children: 45 children with ASD, 26 children with Tourette's Disorder (TD), and 14 children with developmental disabilities (DD). The researchers found significant cerebral enlargements in the ASD group in comparison to the TS subjects. However, there were no cerebral enlargement differences between the TD and DD participants. This led them to conclude that cerebral enlargement was evident in children with ASD (Sparks et al., 2002).

In a related study, Courchesne et al. (2011) looked into the quantifications of developmental abnormalities in cerebral and cerebellar volume among individuals with ASD. They investigated the developmental progression of the cerebrum (white and cortical gray matter) and cerebellum in autistic children aged two to three years through adolescence, utilizing a cross-sectional MRI approach. A significant finding was that 90% of the boys with ASD who had MRI scans before the age of five exhibited brains larger in volume than the average child of the same age. They surpassed two standard deviations about the normal mean, resembling the early development of macrocephaly at a younger age. These observations suggested an accelerated brain growth patterns in ASD during early childhood (Courchesne et al., 2011)

Building upon these findings, Courchesne et al. (2011) investigated brain development between individuals with ASD and typically developing individuals. Their comprehensive study revealed that brain growth with individuals that have ASD

experienced an accelerated growth of brain size during their early years, which then slowed down as they matured. In contrast, typically developing individuals exhibited slower growth, enabling them to acquire connections and functional skills guided by their experiences and activities (Courchesne et al., 2011). Although these studies did not include the influence of music therapy, learning about how the brain develops in children with ASD is important because it informs learning about interventions, such as music therapy, that help them learn developmental skills at an earlier age.

Effects of Music Therapy on ASD

When students with autism engage in music therapy, understanding how they perceive and process music becomes crucial. Bacon et al. (2019) investigated the music-processing skills of individuals with ASD, revealing that some may possess preserved abilities compared to typically developing peers. The materials used were two online questionnaires, which were provided through the JISC (formerly BOS) survey platform. First, the Bucknell Auditory Imagery Scale (BAIS) was given to participants online. The second questionnaire was an earworm (a catchy song stuck in your mind) questionnaire, which was initially used to correlate with schizophyte and mental suppression in their non-clinical sample. Surprisingly, the results indicated that self-reported vividness and control of auditory imagery were reduced in the ASD group compared to the typically developing control group. However, this did not lead to fewer earworms , leaving questions about the prevalence of earworms in the ASD population unanswered (Bacon et al., 2019).

Another researcher, Geretsegger (2016), investigated the impact of music therapy on the brains of individuals with ASD and the potential benefits of the therapeutic

approach. The study focused on the feasibility of the trials and the implementation strategies for music therapy. This made it essential to also assess various factors such as safety, concomitant treatment, and outcome measures. The research concluded that parents were not able to make the three-times-a-week commitment during the study. The inconsistency in attending sessions revealed that students with ASD were not able to get the full benefit of music therapy. Consistency of attendance is an important consideration in developing music therapy interventions that impact skills being taught to children with ASD. The children with ASD did not show increased skills in social skills and regulating emotions, which is what parents wanted (Geretsegger, 2016).

Consistency is crucial for achieving success in music therapy, and the efficacy of the tools employed in this therapeutic approach plays a pivotal role as well. Walworth (2009) investigated how music therapists address the different areas of the SCERTS assessment model during sessions with clients diagnosed with ASD, and the study also compared the frequency of SCERTS domains and goals targeted by music therapists. The SCERTS model is a multidisciplinary assessment that was designed to identify the child's strengths and weaknesses. Additionally, SCERTS assesses ASD progress over time. When parents understand and are trained on how to implement treatment goals outside of the therapy session, they become empowered by the positive interactions their child is using outside of the therapeutic setting. This collaboration between providers and parents is valuable information on student success and the impact in the field of music therapy. Improving the rate of success is valuable information in the field of music therapy. The authors encourage music therapists to orient themselves with the SCERTS model. As the need for evidence-based treatment intervention rises, so does the need for music

therapists to use assessment tools that have meaningful outcomes for students identified with ASD (Walworth, 2009).

The therapeutic power of music in supporting individuals with autism spectrum disorder (ASD) has been extensively explored in various research endeavors, shedding light on its effectiveness and potential benefits for enhancing communication, socialization, and overall well-being. Eren (2017) discusses the approaches and interventions that music therapists reported as useful when intervening with individuals with ASD. Consideration was given to the music therapist level of knowledge about different approaches and preferences in using a variety of music with children with ASD. The music therapists reported that sensory integration, creative music, and behavioral approaches were the most effective music therapy interventions to use with children who have ASD. Sensory integration approach occurred when music was paired with props (bean bags, stretchy bands, etc.). Creative music therapy used an improvisational approach to therapy that involved the composition of music. Finally, the behavioral approach focused on using music as a reward system. Music therapists who preferred using the behavioral approach found success pairing it with social stories as part of the intervention. Creative Music Therapy would often use drum circles and drumming protocols with their interventions. The approaches are helpful in designing an intervention as each approach explains how to pair the music with an activity. In addition, the three preferred approaches support the current scientific research that music therapy is a powerful intervention with ASD findings (Eren, 2017).

Vocal Interaction Communication and Social Strategies (VOICSS) and Voices Together (VT) were paired together to rate changes over-time in language,

communication, and social emotional skills in elementary children with ASD (Schmid et al.,2020). The DUACCS assessment was used to measure baseline and treatment phase outcomes, and was selected due to the case of administration, time to administer, and the ability to use in a school setting. Elementary students with ASD were assessed using an interactive one-on-one setting outside of the music therapy setting. DUACCS collected student behavioral outcomes and teacher reported information. The children with ASD involved in the study displayed a variability of skills. Music was used to engage student participation. Using the VOICSS method, children sat in a circle on chairs for 45 minutes each week for a duration of 16 weeks.

The VOICSS method contained three specialized elements of music, group process, and routine curriculum. Specialized music, counseling skills, and interactive structure were provided to promote language acquisition, communication, and social emotional skills. The VT program was designed for students with ASD to develop self-awareness, understand strengths and challenges in everyday life, identify emotional strengths with themselves and peers, and to develop problems solving skills in a peer group setting. Music therapists had been trained on how to use the VT program. The VT program utilized a group process with students choosing one student with ASD as the speaker. The music therapist used the speaker to announce the song and to encourage social communication. During the session the instructor prompted and provided wait time as needed, filling in words in sentences along with offering sentences when a modeling approach was needed. During each of the VT sessions basic skills of greeting, listening, turn-taking, and gaining attention were practiced and discussed. Several factors affected the results of the study. Children with ASD who had higher baseline language scores

showed the greatest gains while children with ASD who had lower language scores showed modest gains. Due to the expected variability in children with ASD, the outcomes reflect a range in communication, social skills, and language seen in children with ASD. Individual changes and improvement may have resulted due to the 16-week time period and consistency of the VOICSS method and VT program. Using group intervention over time revealed improvement with all participation and may be more effective than one on one sessions of intervention (Schmid et al., 2020).

Gottfried (2018) investigated the effect of music therapy. Music therapy has been an intervention for children since the 1950s. Despite the importance of including parents in their ASD child's therapy programs, there is little known about how music therapy experiences influence everyday activities and contribute to developmental benefits outside of the therapeutic setting. Music therapy programs for young children with autism have followed growing evidence recommending that parents and other family members actively participate in the therapeutic process of the child with ASD in natural settings. Despite the growing emphasis of including family members in the child's therapy programs, little is known about how music therapy influences a child with ASD in everyday life activities that contribute to developmental skills.

Collaboration between music therapy programs for young children has been suggested as a way for caregivers and families to be actively involved in implementing the therapy process outside of the treatment center, which will allow for more information to be obtained. Requirements were specific and included children with ASD who ranged in age from 4-7 years old, had no other identified sensory disability such as deafness or blindness, and had not participated in music therapy for 12 months preceding

the study. The parent groups spoke either English or Hebrew and had no identified significant disability. The music therapists had over five years of experience working with families with disabilities.

The purpose of the study was to determine whether young children with ASD, who participated with their parents in shared music activities, gained social interaction skills in natural settings. One of the study limitations was that no psychometrically validated assessments existed to measure the extent of shared music activity with family or in community contexts. Analysis used two predetermined subscales: Music in Everyday Life Joint activities (MEL-JAM) and Music in Everyday Life-Routine Activities (MEL-RAM). A self-report assessment was developed to test the reliability of using Music in Everyday Life (MEL) by parents of the children with ASD.

Parents were involved with music activities that included playing musical instruments, listening to different genres of music, singing together, and listening to familiar music played by the family. A 5-point Likert scale was used to determine the amount of time activities were used during the week, and a 4-point Likert scale measured the quality of the interaction. Additionally, parents' perception of the interactions were rated as either positive or negative experiences.

Results indicated that parents can and do use music to engage their child with autism in the home, spending an average of 2.8 hours each week singing, playing instruments, and listening to music. Parents are the ones who provide important developmental opportunities for their child outside of treatment. Music therapy may be another way for parents to scaffold learning for their child with ASD into everyday life experiences. Parents who actively participated in music-oriented parent counseling

sessions, provided by a music therapist, were able to incorporate music therapy techniques that were discussed and demonstrated this in their everyday routines (Gottfired et al., 2016).

Music therapy is one intervention that can be used, but what about other interventions, and how do they help prepare students with ASD for the future? Kucharczyk et al. (2015) investigated whether evidence-based interventions being implemented in secondary education were being used for students with ASD to teach skills and supports, as well as prepare them for college and independent life. The study indicated that there needs to be more training and professional development on the interventions that are being used in the classrooms. Parents experienced that most teachers were understanding the diagnosis of autism, but observed inconsistencies between teachers' expectations and an ASD child's ability to meet those expectations. At times, parents reported that the teacher knew their child had autism but thought the child was capable and was just being lazy or stubborn (Kucharczyk et al., 2015). Professional development needs to be consistently updated in schools so teachers can help parents understand more about their children. Parents need to emphasize how music can support and regulate their child's behavior throughout the day. Even though this article does not specifically discuss music therapy, parents can advocate when and how music therapy can be used in different situations to promote a greater awareness of how to support ASD learning in school settings.

Music Therapy has many positive and negative effects. One researcher, Kaplan (2005), conducted a study on the music therapy interventions, the interventions used, session types, formats, frequency, and goals addressed. The severity of students with

ASD and the transfer of skills out of the treatment setting were considered during their research. The intervention, which looked into language/communication and behavioral/psychology, advised music therapists to start with the behavior and language needed before looking into motor development, cognition, and musical skills. They reported that 100% of the primary objectives and 77% of the secondary objectives were achieved within the first year. Cognitive and intermediate objectives were fully met, and 80% of perceptual/motor intermediate objectives were achieved. However, behavioral/psychosocial and language/communication objectives were not the same, and only 74% of those were met (Kaplan, 2005 p. 7).

Improvisational music has increased communicative behaviors in students with ASD. Kim et al. 's (2008) investigated the effects of improvisational music therapy on joint attention behaviors in preschool children with autism. Ten boys with ASD were divided into two groups. Each group had 12 weekly 30 minute sessions of improvisational music therapy and 12 weekly 30 minute play sessions with toys. Group one had music therapy first and play therapy after, group two had play therapy first followed by music therapy. Both groups were evaluated for joint visual attention skills after the music therapy session and after play therapy. The results revealed that improvisational music therapy was more effective than play therapy in sustaining joint attention behaviors and non-verbal social communication skills in ASD children. Furthermore, the frequency of eye contact and turn-taking for ASD children increased during music therapy versus the play therapy sessions (Kim et al., 2008).

Finally, Lygeraki (2019) investigated the development of social and communication skills through music therapy in a six year old individual with ASD. This

review focused on emotional development, behavioral problems, and academic performance. The researcher aimed to look into the impact of music therapy on the emotional development of the individuals with ASD, improvements in their behavioral problems following the intervention, and improvements in their general positive and social behavior. A six-year-old child with ASD, four special education teachers and two music therapists participated in the research. Structured (observation) and semi-structured (interview) was used as the qualitative research method. The six-year-old child was observed during four weeks to determine changes in social and communication skills while using music therapy as an intervention. A survey was developed with seven interview questions that the four special education teachers and two music therapists completed. All special education teachers and music therapists agreed that music therapy helped the child with ASD in communicating and controlling his behavior. The results indicated that using music therapy at a young age supported substantial improvement in skills taught in a classroom setting (Lygeraki, 2019).

Regulating Emotions

In the classroom, students with autism spectrum disorder (ASD) often struggle to regulate their emotions, especially in bright and loud environments. To help them cope, teachers employ strategies like providing headphones and sunglasses, which enable these students to tolerate sensory overload. Another successful approach is integrating music into the classroom, which has been found to have a calming effect and helps students engage in classroom activities more effectively. Quintin et al. (2010) conducted a study to explore how individuals with ASD perceive and differentiate emotions in music compared to typically developing (TD) individuals. The ASD group performed slightly

below the TD group in identifying emotions such as happy, sad, scared, and peaceful. The researchers used statistical measures, including ANOVA and ANCOVAs, to analyze the participants' performance. While the ASD individuals' accuracy in identifying emotions was lower than that of TD individuals, both groups demonstrated similar abilities in recognizing some emotions. The study also included the Verbal Intelligence Quotient (VIQ) assessment, revealing no significant differences between the "intended emotion" and the diagnostic group. These results suggested that both ASD and TD individuals were able to identify emotions with comparable accuracy (Quintin et al., 2010).

Another study by Allen (2012) examined the impact of music on high-functioning adults with ASD and their ability to verbalize emotions. The study involved two groups, one consisting of 23 adults with ASD and another comprising 24 adults without an ASD diagnosis, and neither group had prior musical knowledge. The findings showed no differences in age, gender, or receptive vocabulary between the two groups. However, the ASD adults scored significantly lower on the verbal measure, indicating alexithymia, or difficulty describing emotions verbally. Although the ASD adults physically responded to the music, they struggled to articulate their feelings effectively (Allen, 2012). These studies collectively underscore the potential of music as a valuable tool in supporting individuals with ASD, both in emotion regulation and emotional expression, offering promising avenues for creating more inclusive and supportive learning environments.

In their investigation of improvisational music, Kim et al. (2009) explored the social-motivational aspects of music therapy that were influenced by the interactions between the student and the music therapist when using improvisational music therapy.

The research was designed to measure emotional, motivational, and interpersonal responses of the participants in this study. Using the ANOVA statistical analysis, the results revealed that the children in the study were able to express their emotions during the therapeutic sessions. During additional music therapy sessions, the children's skills continued to improve in matching and expressing emotions. It was also found that children were able to better match and express emotions over more sessions in music therapy. The only emotions that were not introduced and researched was the emotion of joy. Children and music therapists that had developed positive relationships during the music sessions had more success when identifying and responding to the emotions that they were presented with (Kim et al., 2009).

Background music is something that is not only used in center-based classrooms, but in all classrooms. Katagiri (2009) conducted a study to explore the impact of using background music and song texts in teaching emotional understanding to children with autism, aiming to assess the effectiveness of four different conditions and their effects on participants' emotional comprehension and expressive skills. Using songs that were familiar or easy to remember were more engaging for the participants. Music interventions that used text and background music were effective in improving the ability to decode and encode emotions. The most effective method emphasized using familiar music in environments that the child was comfortable in. Study results found that three of the four emotions in question one was counterbalanced and learned during the treatment sessions. The pretest and posttest results in the second question saw substantial improvement in the participants' understanding of the four emotions. The third question found that expressive skills revealed gains in the pretest and posttest results. Using

background music and song text to teach emotional understanding to children with autism was found to be a successful intervention (Katagiri, 2009).

In the classroom, the ability to discern students' emotions, especially through facial expressions, holds significant importance. Teachers are constantly attentive and observant, analyzing their students' nonverbal cues to identify any signs of emotional distress or the need for assistance when they struggle to articulate their feelings. Wagener et al. (2020) studied if the use of congruent music would enhance facial emotion recognition. The study indicated that students in the TDI group had faster reaction time to emotions while ASD children required more time to recognize the same emotions. Studies of the brain structure of individuals with ASD have identified that the amygdala (the temporal part of the brain that processes a memory of emotions) is often impaired. This may have accounted for the slower reaction time of the ASD children. An additional finding of the study indicated that the tone, rhythm, and pace of music may influence emotions and improve social skills for children with ASD (Wagener et al., 2020). This shows that specific types of music can elicit varied effects on students' emotions. Depending on the emotions they exhibit, certain music genres may assist in regulating their emotions and facilitating their re-engagement in the classroom.

The use of music and color have been studied to have a relaxing effect on people who have learning disabilities and autism. Barber (1999) did a small case study looking more specifically into this research on music and color. The case study included one patient by the name of Chris, who showed multiple forms of aggression towards staff in the home that he lived in. They would normally take Chris to the multisensory room each day where he would listen to music and color. Staff would tend to see a decrease in his

physical behaviors when Chris would have daily breaks in the room (Barber, 1999). In conclusion, music-based interventions have shown promise in supporting individuals with autism spectrum disorder (ASD) by enhancing emotion regulation and expression in the classroom. These interventions include background music, song texts, and congruent music for facial emotion recognition, providing potential benefits in emotional perception and behavior management for students with ASD.

Social Skills and Speech

Students identified with ASD often have trouble with their social skills when around people and engaging in conversation. Mössler et al. (2019) studied whether there was a therapeutic relationship in music therapy with ASD children that predicts generalized changes in social skills. The study found that when the music therapist is musically and emotionally attuned with the child, meaningful development occurs between the student and the therapist increasing the frequency of communication. The study used the Autism Diagnostic Observation Schedule (ADOS). The ADOS consists of a series of structured and semi-structured tasks and takes approximately 30 to 60 minutes to administer. The examiner used this assessment to determine how developmental trajectories would change over time. Additionally, the Social Responsiveness Scale (SRC) was used. The SRC identifies social impairment skills in individuals with ASD. Results found that when using the ADOS there was a slower increase between 5 months to 12 months. The SRC was more specific in measuring behavior that was more pronounced at 5 months but would slow down at 12 months. However, this may have been affected by parents using the SRS who noticed changes more quickly, thus rating the behavior higher (Mössler et al., 2019).

Music therapy is occasionally utilized as an intervention beyond the confines of the classroom. Kern (2006) discusses the incorporation of music therapy as an integrated technique within the classroom. Their research aimed to enhance peer interaction among students with autism while they were outdoors on the playground. The study highlighted the challenges that an unstructured playground environment can pose for children with ASD. The investigation involved four boys with autism and their typically developing classmates, all of whom participated in sessions held twice daily on a regular playground. To infuse elements of music therapy into play, specific areas were designated on the playground, including a music hut in the largest sandbox furnished with musical instruments for the students to engage with. Close collaboration with teachers was maintained to ensure proper integration of these tools into lessons. Additionally, certain songs were incorporated during circle time prior to interventions. Playtime activities were observed and recorded in 10-minute intervals. Data points were noted when the target child entered the music hut or when the child and another peer entered it together; however, data was only collected once per day. Results indicated that the data aligned with the typical traits of students with autism, who tend to engage less in meaningful play compared to their neurotypical peers. While the music hut was explored and utilized during the study, it did not yield the intended outcomes for enhancing peer interactions. Nevertheless, it was observed that incorporating therapeutic music into goals led to positive outcomes for the students (Kern, 2006). This underscores that while music therapy might not have directly addressed the challenge of fostering peer interactions on the playground, it remains a valuable asset when integrated into music lessons within the classroom.

Examining the effect of music therapy on children with autism spectrum disorder (ASD), especially in regards to speech production and communication skills when music and speech training were provided simultaneously. Lim's (2010) study looked into how music therapy can increase speech production. Results of the study indicated that students who received both music and speech training simultaneously improved in all aspects of speech production and communication skills. One finding indicated that music perception is similar to how speech/language information is processed in the brain. Students with ASD had an ability to predict similarities in speech and music patterns. The study reinforced the notion that there is a close relationship between music and the development of language skills in young children. They found that lower-functioning students with echolalia were able to produce higher results using music in combination with their speech training. This relationship supports the impact of using music with children identified with ASD (Lim, 2010).

Similarly Simpson et al. (2009) explored whether children with autism could learn to articulate words and symbols of animals using the song "Old McDonald" and interactive whiteboards. The study showed that the participants increased their receptive responses while singing and using interactive whiteboards. Music can reinforce symbol identification and receptive language skills. One participant was even able to successfully label animal symbols on the PowerPoint and interactive whiteboard without auditory support. The findings highlighted the capability of music to facilitate language learning and symbol recognition (Simpson et al., 2009).

Children that have autism are on a spectrum and are not alike. A study by Drossinou-Korea et al. (2016) looked into the expressions of children with autism that are

verbal and nonverbal and how they express their emotions in participating in activities in music therapy. Music therapists would have children, during music therapy lay facing down on a swing, and they would sing a lullaby. During this session, there would be multiple therapists in the room, and the child would look at the therapists that would be singing, and the expression they would make would be recorded. The music therapists found that the games and activities that were performed helped the student participants improve communication skills. This shows that music therapy aimed at emotional regulation and singing can have a significant improvement on speech articulation and verbal communication (Drossinou-Korea et al., 2016).

When thinking about social interaction, non-verbal social cues are often overlooked. In her study on music therapy's impact on eye gaze, joint attention, and communication in children with ASD, LaGasse (2014) investigated the use of assessment tools like The Social Responsiveness Scale (SRS), the Autism Treatment Evaluation Checklist (ATEC), and video analysis of sessions to discern the differences between a music therapy group (MTG) and a no-music control group (SSG). Both groups had welcome exercises that included sensory activities and social experiences that concluded with a farewell activity. The MTG included trained music therapists, while the SSG group was led by a certified educator. They found that there were substantial differences in the eye gaze between the two groups. The MTG group showed greater gains than the no-music SSG. There were no significant differences between the two groups in the areas of initiation of communication, response to communication, or social withdrawal/behaviors. During the study it showed that the MTG group showed increased social behavioral skills. The study conducted by LaGasse (2014) offers evidence

suggesting that music therapy group sessions focused on social skills have the potential to enhance joint attention and eye gaze toward other individuals.

Similarly, Sharda (2018) conducted a study comparing the effects of an 8-12 week music-based intervention to a non-music control intervention on social skills, more specifically looking into the quality of life, and functional brain connectivity in children aged 6-12 with autism spectrum disorder (ASD). In the sessions, the students were given activities that targeted social communication, multisensory integration, and emotional regulation. The sessions lasted about 45 minutes and were conducted individually. The study revealed that communication scores were higher in the music group post-intervention. In addition, the musical group scored higher on the resting-state brain functional connectivity vs the non-musical group. These findings substantiated the idea that music intervention was a predictable and structured method to reinforce social communication skills when used with ASD children over an 8-12 week period. When taught in isolation, communication skills continue to be impacted by sensory and social difficulties observed with ASD children. This study revealed that the consistency of providing 8-12 weeks of music therapy positively impacts communication skills and functional brain connectivity with school-aged children with ASD (Sharda, 2018).

Strategies to Implement Successful Instruction

When incorporating music therapy into your classroom, the choice of music becomes an important consideration. Kalas (2012) looked into the impact of employing simple versus complex music in the context of individuals with ASD. To clarify, simple music refers to compositions featuring uncomplicated chords and straightforward sounds, whereas complex music involves intricate tones and elaborate musical accompaniment.

The study's evaluation of joint attention effects was facilitated through the Early Social Communication Scales (ESCS), an assessment tool. Over a three-week period, each participant engaged in six sessions, each spanning 10 minutes. The study's design maintained control by randomly assigning individuals to either complex or simple music sessions. The results unveiled that simple music yielded greater efficacy in developing joint attention skills for students with severe ASD, while complex music showed a more pronounced impact on students with mild to moderate ASD in terms of joint attention skills (Kalas, 2012). When used properly, music emerges as a critical educational tool that, when integrated thoughtfully into the classroom environment, can enhance student concentration on essential skills.

When talking about the future, we want to be more inclusive for students that have autism and make sure that they are able to join the classroom while ensuring that teachers have the right tools. Hourigan et al. (2017) discussed their strategies for teachers to learn how to work with students that have autism to make sure that more students are able to enjoy music and everything that it brings. This article is more geared towards teachers working with students who have ASD, and how to help them. The article stated that when teachers use approaches that are careful to pay attention to the theory of the mind (the ability to process information from another's perspective) it can be of great success to the children with ASD in the classroom. It shows that it will improve control coherence, executive function, cognitive processing, joint attention, social reciprocation, and classroom behaviors in the classroom. The article showed how students with ASD will often have comorbid cognitive deficits. When we know how to work and accommodate these deficits, students will be able to become more engaged in the music

classroom and behaviors can be managed better. It is also noted that ASD and classroom behaviors can be complicated and that this is not an answer to everything. It is important to know this information so that you are able to fully teach and help students that have ASD in your classroom and to make sure that they are fully successful. Finally, relationships with your students are always key and that letting them explore and including their interests will help you keep your students engaged in the lesson and find the joy that music can bring (Hourigan et al., 2017).

CHAPTER III: DISCUSSION AND CONCLUSION

Summary of Literature

To summarize Chapter II it would be important to look at the questions that were asked at the beginning of the thesis. The questions were: 1. How does music therapy help students with ASD? 2. What must parents understand about music to help care for their children with ASD?

How Does Music Therapy Help Students with ASD?

The perception and treatment of individuals who have been diagnosed with autism has been influenced by science, culture, and social factors. Autism is referred to as autism spectrum disability (ASD) due to the varying degrees of skills and behavior presented. While individuals identified with ASD have varying degrees of skills and behaviors, the most obvious feature of the disability affects interaction skills in the areas of communication and behavior. Considerations of how music therapy impacts and helps students have been researched in several studies.

Music therapy exerts a multitude of effects on individuals with ASD, encompassing various dimensions. Notably, this therapeutic approach has been found to assist students in regulating their emotions and enhancing their social and language proficiencies (Allen, 2012; Eren, 2017; Geretsegger, 2016; Kim et al., 2008; Kim et al., 2009; Lim, 2010; Lygeraki, 2019; Quintin et al., 2010; Sharda, 2018; Simpson et al., 2009). When administered as a group intervention over time, noticeable enhancements were observed across all participants (Schmid et al., 2020). Employing games within music therapy also yielded positive outcomes by enabling children to effectively convey their emotions (Drossinou-Korea et al., 2016). However, discrepancies emerged in

achieving objectives related to behavioral and psychosocial aspects, as well as language and communication; not all intended goals were accomplished through music therapy (Kaplan, 2005). Furthermore, the pivotal role of interest surfaces as a crucial factor in determining the efficacy of music therapy as an intervention (Kern, 2006).

Students with ASD exhibit a range of skills that affect developmental skills, communication, and behavior. The challenge is finding content and a learning environment that is appropriate to meet their needs. Through research the benefit of music therapy, in combination with areas of learning, has documented strategies that improve communication skills and regulate behavior. Assisting students with skills based on appropriate music and intervention strategies will enhance their experiences, improve areas of deficit, and provide support as they progress through the K-12+ educational curriculum.

What Must Parents Understand About Music Therapy to Help Care for Their Child With ASD?

Parents spend the most time with their child and are their primary caregiver. Family involvement and the relationship with teachers and therapists are key sources of support. When their child is referred for an assessment, parent involvement and collaboration is essential. Their involvement provides an opportunity for parents to express their beliefs and concerns, what they are observing, along with their child's current needs. One of the ASD assessments discussed in the research was the SCERTS model which is a multidisciplinary assessment that is designed to identify the child's strengths and weaknesses. Using this assessment would provide a foundation for developing specific goals to implement across all settings and to assess progress over

time. The SCERTS assessment would provide an understanding for parents as to where the child's developmental level is at and how to proceed with intervention strategies that will influence learning.

When discussing the treatment plan several different options could be shared as tools to help their child tolerate their environment. When parents understand and are trained on how to implement treatment goals, they become empowered by the positive interactions their child is using outside of the therapeutic setting. Improving the rate of success in treatment and in the child's natural settings is valuable information in the field of music therapy (Walworth et al., 2009).

As the treatment plan begins parents will be encouraged to attend sessions and receive training on implementing music therapy strategies in their home and the child's natural environments. Asking parents what type of music their child listens to in natural settings would provide therapists and teachers information on using the same genre when working with the child. Research has substantiated that using familiar music and genres may increase the child's engagement in the learning activity (Katagiri, 2009).

Understanding perceptions and cognitive processing may help parents understand how their child is processing music. Children with ASD have different perceptual and cognitive processing styles, this may influence how they interpret musical stimuli. Some demonstrate heightened sensitivity or attention to specific patterns, tones and rhythms which help identify emotions and understanding of music. Decoding and encoding in the context of music, occurs by listening to the music (decoding) and (encoding) transforming auditory information into meaningful memory, this is a step in the process of developing perception and meaningful memory. Using background music and song

texts teach emotional understanding to children with autism and have been found to be a successful intervention (Katagiri, 2009).

Explaining how music perception and speech/language information is processed in the same area of the brain will provide parents information on the impact of teaching both together. Additionally, sharing information on the research found that children who used both music and speech/language training benefitted in all aspects of speech production and communication skills. This will reinforce the importance of using both areas simultaneously in instruction (Lim, 2010).

Understanding the benefit of music therapy in helping parents care for their child is essential. Parent involvement and collaboration is a necessary part of this process. Parent involvement provides an opportunity for parents to express their beliefs and concerns, what they are observing in their child, along with their child's current needs. In the process of providing information on how music will help their child it is important to understand the parent's role. Parents are their child's primary caregiver. Providers need to listen and pay attention to what parents are sharing, as they know their child the best. The collaboration between providers and parents will develop an understanding of how the treatment process is progressing, how their child is transferring skills to their natural settings outside of therapy and how to continue to support their child. The benefit of music therapy, between parents and providers, will support their child's experiences, address areas of deficit and provide mutual support through the intervention process.

Limitations of the Research

When reviewing the research on individuals with ASD, I excluded articles that were 30 years old due to the changes in the definitions of ASD. Additionally, the current

literature on behavior, social skills, and communication interventions provide more promising practices in improving outcomes for individuals identified with ASD.

There are several limitations that were noted while reviewing the research surrounding ASD. Consistency and duration of the intervention was often limited. Consistency of attendance and duration of the therapy was discussed and revealed how this attribute positively impacts skills being taught to children with ASD. The inconsistency in attending sessions during some of the studies resulted in children with ASD not obtaining the full benefit of music therapy. When children with ASD had inconsistent attendance social skills and regulating their emotions did not increase, which is what the parents had hoped would happen (Gretsegger, 2016). Another study revealed that the duration of providing 8-12 weeks of music therapy positively impacted communication skills and functional brain connectivity in school-aged children with ASD. These results support that consistency and duration of intervention is needed to document progress and change in children with ASD (Sharda, 2018).

As the need for evidence-based treatment intervention rises, so does the need for music therapists to use assessment tools that have meaningful outcomes for students identified with ASD. The authors of the SCERTS model found that while this assessment was a multidisciplinary tool for students identified with ASD music therapists needed to orient themselves with this model to effectively bring about change in the goals and objectives used in the treatment of individuals with ASD (Walworth, 2009).

More psychometrically valid assessments need to be developed to measure the extent of shared music activity with families or in community contexts. Many of the studies relied on qualitative methods to measure the progress of music therapy because

psychometrical assessments were not available. One of the music therapy interventions used Likert Scales with parents validating the outcomes of the study (Gottfired et al., 2016). While parent information is helpful in reporting change, (Mossler et al., 2019) found that parent report rated changes at a higher level when the change occurred in the initial stages of the intervention. The duration of studies often did not have extended follow-up which limited knowing whether progress continued or stayed at the same level.

Another limitation occurred due to research that was obtained in different countries where beliefs may have impacted the results. Some of the music genre was based on family culture and traditions. The specific types of music can elicit varied effects on the emotions of children with ASD (Wagener et al., 2020). The music therapists and certification process differed in several of the countries, thus the experience and training provided to children with ASD may have been influenced by the level and training of the music therapists.

The study sizes were limiting. Some studies had several children drop out of the study, thus limiting the number of children participating in the intervention. One of the studies consisted of all males due to three of the females dropping out of the study (Kim et al., 2008). While there are more male children identified with ASD, there needs to be research that includes both male and female subjects. Another study had only one six-year-old male subject, Lygeraki (2019).

Often the studies discussed higher and lower functioning children with ASD who participated in the studies. Some studies referred to using the Verbal Intelligence Quotient (VIQ) assessment which involved using a questionnaire to assess ability. Studies reported higher and lower functioning students with ASD with no range in verbal

intelligence quotient reported. Identifying the differences in ability levels would be helpful information when planning treatment interventions.

Most studies relied on qualitative studies using observations and survey questions. The conditions across these studies varied with participants that included music therapy, special education teachers, general education teachers, and parent reports. I gained an appreciation for the information that was provided by the different groups. However, more quantitative assessment instruments need to be developed to obtain the variation in performance of children with ASD who have identified ability levels. This will provide more options to be researched and developed within the different performance level of individuals with ASD.

Implications for Future Research

When looking into future research on how music therapy impacts students with ASD, it was important to review past research. I appreciated the research that was not limited to behavior, but rather focused on speech and brain activity. In the future, I would like to see research that focuses on other disabilities and how that can help students self regulate. Finally, I would like to see more research focus on best practices on how teachers can incorporate music therapy into the classroom. I worry that teachers are hesitant to work with students that have significant disabilities and struggle to self-regulate their behaviors. I hope that with more research, teachers will be more confident in their skills and provide more inclusion for students with disabilities in the classroom.

Implications for Professional Application

While researching on how music therapy affects students with ASD, I reflected on how the information, intervention and strategies could have direct application to implement with the special education students that I work with. As an elementary resource teacher working with students who have disabilities ranging from autism (ASD), learning disabilities (LD), developmentally cognitively delayed (DCD), and emotional behavior disorder (EBD), I continually search for curriculum to help students who struggle with academics, social skills, behavior, and communication. This research has provided me with a better understanding of ways to present instruction that will offer alternative strategies to teach and reach students who have unique learning styles. This has been an invigorating adventure and provided a pathway to share and implement the information gained with parents, other educational staff, and in developing the IEP. I have also learned information that has provided ways to advocate for the needs of students I serve, and to teach them how to self-advocate when not understanding how to respond in learning skills and regulating their emotions.

Part of working with students is forming a relationship and understanding what motivates them. If a teacher does not have a relationship or a bond with their students, then they will never fully be able to manage the students and their behaviors (Lim, 2010; Drossinou-Korea et al., 2016; Kim et al., 2009). When reviewing articles on the development of the brain in children with ASD I gained knowledge and an understanding on how brain development occurs in children with ASD (Grossman et al.2009, Sparks et al., 2002, Courchesne et al., 2011). This is important because it has provided interventions, such as music therapy, that help individuals with ASD learn developmental

skills at an earlier age. Additionally, it has provided me with needed information to support instruction in various settings and become a better teacher for children with ASD.

Part of my job is to convene IEP meetings, which can include the child's parents, a Developmental Adaptive Physical Education (DAPE) teacher, a Speech Language Pathologist (SLP), a Deaf and Hard of Hearing (DHH) teacher, and someone representing the disability (who is licensed in the specific disability area). During an IEP meeting discussion involves documentation on student progress on their goals, and additional changes that need to be made. This meeting includes services, accommodations, and how the child is doing on their behavioral plan (if they have one). It is crucial to know whether the child is making progress and to be well informed about their needs. Documenting student progress is essential information in determining whether the intervention strategies are making a difference in improving the rate of success in special education services provided. As the need for evidence-based treatment intervention rises, so does the need for educators to use assessment tools, such as the SCERTS model, which identifies strengths and weaknesses and has meaningful outcomes for students with ASD (Walworth, 2009). I learned about interventions that have a multimodal approach which may lead to helping my students to be successful in more inclusive classroom environments. This supports that there needs to be training and professional development on the interventions that could be used in the classroom (Kucharczk et al., 2015)

Students with ASD struggle to regulate their emotions, especially in bright and loud environments. When behavior escalates and is consistently occurring in a classroom setting the student with ASD is often recommended to a more restrictive classroom setting. During the research of my thesis, the potential of music was found to be a

valuable tool for supporting individuals with ASD, both in emotion regulation and emotional expression (Allen, 2012). I found that this intervention could have a positive impact on the total classroom and offers a promising practice for creating more inclusive and supportive learning environments to regulate behavior.

Finally, through my thesis research several studies revealed how unique and different a child with ASD is. How they participate in and express their emotions caused me to observe both the verbal and nonverbal ways a child with ASD responds (Drossinou-Korea et al., 2016). By learning different intervention approaches used by music therapists, I gained knowledge on what activities could support sensory integration, creative music therapy and the behavioral approach. Learning specific examples such as use of props, creating music, pairing social stories with behavior interventions gave way to implement music with learning. The approaches are helpful in designing an intervention as each approach explains how to pair the music with an activity. In addition, the three preferred approaches support the current scientific research that music therapy is a powerful intervention with ASD findings (Eren, 2017). Through this research I have acquired a better ability to be an advocate for my students for what they need, what they are going through, and how to learn the skills they need to succeed. I will be able to help parents understand their child's disability and give them hope and what can be done to help their child succeed and improve skills. In today's world, we're seeing an increased demand for more tools to help children learn, manage their mental health, and regulate their emotions. Learning more about music and how that can help the brain with emotions, social skills, and speech articulation will help my students.

Conclusion

Autism is complex, not clearly understood or agreed up, and the definition of autism has gone through significant changes. It continues to be an enigma to medical, psychiatry, therapeutic providers, educators, and to families whose child has been identified with autism. The perception and treatment of individuals who have been diagnosed with autism has been influenced by science, culture, and social factors. Autism is currently referred to as autism spectrum disability (ASD) due to the varying degrees of skills and behavior presented. While individuals identified with ASD have varying degrees of skills and behaviors, the most obvious feature of the disability affects interaction skills in the areas of communication and behavior.

It wasn't until the 1990 reauthorization act of Individual Disabilities Education (IDEA) that the category of autism was introduced as a new disability category. Prior to 1990 children with ASD were inappropriately identified individuals who were placed in programs or settings that were not appropriate to meet their needs.

A cure or prevention for autism does not exist. There have been several notions about what causes autism and yet there are no definitive answers. What is known about ASD is that it is a neurodevelopmental disorder that presents differently from one individual to another. Autism is a complex disorder that may have had several risk factors that contribute to the disorder. These factors can be explained by genetic through genomics (the study of a person's genes), prenatal and perinatal factors (factors during pregnancy or very early infancy), neuroanatomical abnormalities (brain-based abnormalities) and environmental factors (a person's exposure to chemicals or toxins prior to inception).

The looming question is what do we know? We have learned that students with ASD exhibit a range of skills that affect developmental abilities, communication, and behavior. The disability affects how a person with autism understands and makes sense of the world. They may view normal patterns of behavior as difficult to understand. The challenge that remains is finding content and learning environments that are appropriate to meet their needs.

Assessment instruments have improved our ability to appropriately identify treatment options for ASD students. The SCERTS model has given parents and service providers a multidisciplinary assessment that identifies the child's strengths and weaknesses. Using the SCERTS assessment provides a foundation for developing specific goals to implement across all settings and to assess progress over time. The ADOS assessment has been used to determine how developmental trajectories change over time. Additionally, the Social Responsiveness Scale (SRC) has been successful in identifying social impairment skills in individuals with ASD.

Through research, the benefits of music therapy in combination with areas of learning, have documented strategies that improve communication skills and regulate behavior. There are several different tools and interventions used to improve skills with students identified with ASD. Music therapy is an intervention used for ASD students that has shown promise in improving behavior, communication, and social skill learning.

Music therapy is an evidence-based practice. An evidence-based practice involves an ongoing review of research literature to determine what information is credible. The research also gives support as to what practices would be the most effective in treatment.

The recommendations were evaluated to determine their effectiveness in using music therapy in the treatment of autism.

To be an effective intervention parents need to understand how music therapy will help their child. It is important for therapists and providers to understand the parent's role. Parents are their child's primary caregiver. Providers need to listen and pay attention to what parents are sharing, as they know their child the best. The collaboration between providers and parents will develop an understanding of how the treatment process is progressing, how the child is transferring skills to their natural settings outside of therapy and how to continue to support the child. Assisting students with skills based on appropriate music and intervention strategies will enhance their experiences, improve areas of deficit, and provide support as they progress through the K-12+ educational curriculum.

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