



Music Therapy and Special Education Services Brief Update of Published Evidence

Music Therapy is a recognized health profession in which music is used to address physical, emotional, cognitive, behavioral and/or social functioning. In school settings, music therapy and music-based interventions can facilitate development in communication and sensorimotor skills, promote learning readiness, learning and skill acquisition, stimulate attention, and increase motivation to participate more fully in other aspects of the educational environment. Music therapy serves as an integral component in helping children in schools and in early childhood settings attain educational goals identified by their IEP team, through direct and consulting services with a credentialed music therapist.

A growing body of evidence from peer reviewed research informs evidence-based music therapy practice in school settings. Selected findings drawing from recent research (2014-2021) are highlighted. Citations focus on systematic reviews and meta-analyses, where possible, synthesizing findings across multiple studies for a particular subtopic or outcome. For some topics, older landmark citations are included for reference.

Autism Spectrum

Music therapists use a range of music-based interventions and approaches to meet the individual needs of the child with autism. Music therapy interventions engage children and foster capacity for flexibility, creativity, variability and tolerance of change. Given the structure and behavioral demands in school settings, these capacities scaffold outcomes and objectives commonly identified in IEPs. Recent articles highlight trends in a growing base of evidence.

Geretsegger, M., Elefant, C., Mössler, K. A., & Gold, C. (2014). Music therapy for people with autism spectrum disorder. *The Cochrane Database of Systematic Reviews*, 2014(6), CD004381. <https://doi.org/10.1002/14651858.CD004381.pub3>

Ten studies (n=165) were reviewed systematically examining the short- and medium-term effect of music therapy interventions (one week to seven months) for autistic children. Music therapy intervention was superior to 'placebo' therapy or standard care with respect to social interaction, non-verbal and verbal communicative skills, initiating behavior, and social-emotional reciprocity. Music therapy was also superior to 'placebo' therapy or standard care in the areas of social adaptation, joy, and the quality of parent-child relationships. Quality of evidence across studies ranged from moderate to low due to size of studies and design limitations of applied trials in the field.

LaGasse, A.B. (2017). Social outcomes in children with autism spectrum disorder: A review of music therapy outcomes. *Patient Related Outcome Measures*, 8, 23-32. doi: 10.2147/PROM.S106267 <https://www.dovepress.com/social-outcomes-in-children-with-autism-spectrum-disorder-a-review-of-peer-reviewed-fulltext-article-PROM>

Evidence continues to grow indicating music therapy treatment is beneficial for improving social skills in children with autism. The unique qualities of music within therapeutic interventions provide a foundation for practicing social skills, including social engagement and joint attention. Gaps in research remain, e.g., older students' perception of the value and benefit of their music therapy, extent of generalizability of outcomes outside the clinical/classroom setting.



Bieleninik, L., Geretsegger, M., Mössler, K., Assmus, J., Thompson, G., Gattino, G., Elefant, C., Gottfried, T., Iglizzi, R., Muratori, F., Suvini, F., Kim, J., Crawford, M. J., Odell-Miller, H., Oldfield, A., Casey, Ó., Finnemann, J., Carpenete, J., Park, A. L., Grossi, E., ... TIME-A Study Team (2017). Effects of Improvisational Music Therapy vs Enhanced Standard Care on Symptom Severity Among Children With Autism Spectrum Disorder: The TIME-A Randomized Clinical Trial. *JAMA*, 318(6), 525–535.
<https://doi.org/10.1001/jama.2017.9478>

The TIME-A trial was the first international multisite trial reporting on one specific music-based approach (Improvisational Music Therapy). The findings on the primary outcome (social affect score) were inclusive; however multiple secondary findings were significant among SRS subscales. This music therapy approach was associated with greater improvements than standard care in social motivation and autistic mannerisms. Low-intensity (fewer sessions) music therapy, compared to standard care, was associated with greater improvements in social awareness; and, high-intensity music therapy resulted in improvements in autistic mannerisms. Finally, there was a higher proportion of improvement in ADOS social affect in music therapy, particularly in children who received at least 15 music therapy sessions. This trial, in part, yielded many lessons informing a path for more refined and focused research as well as informing practitioners on service intensity (low vs high duration/dosing).

Sharda, M., Tuerk, C., Chowdhury, R., Jamey, K., Foster, N., Custo-Blanch, M., Tan, M., Nadig, A., & Hyde, K. (2018). Music improves social communication and auditory-motor connectivity in children with autism. *Translational Psychiatry*, 8(1), 231.
<https://doi.org/10.1038/s41398-018-0287-3>

Does an 8–12-week music therapy protocol impact social communication, family quality of life, and brain connectivity? This clinical trial evaluated neurobehavioral outcomes of a music therapy intervention, compared to a non-music control intervention in school-age children (n=51 aged 6–12 years with autism). The music-based intervention involved use of improvisational approaches through song and rhythm to target social communication. Groups were assessed before and after intervention on social communication and resting-state functional connectivity of fronto-temporal brain networks using imaging technology. Communication scores were higher in the music group post-intervention. Associated post-intervention resting-state brain functional connectivity was greater in music vs. non-music groups between auditory and subcortical regions and auditory and fronto-motor regions. Post-intervention brain connectivity was lower between auditory and visual regions in the music compared to the non-music groups, an area known to be over-connected in autism. Post-intervention brain connectivity in the music group was related to communication improvement. This study provides evidence that 8–12 weeks of individual music intervention can improve social communication and functional brain connectivity, lending support to further investigations of neurobiologically motivated models of music-based interventions in autism.

Thompson G. A. (2018). Long-Term Perspectives of Family Quality of Life Following Music Therapy With Young Children on the Autism Spectrum: A Phenomenological Study. *Journal of Music Therapy*, 54(4), 432–459. <https://doi.org/10.1093/jmt/thx013>

This follow-up study examined the impact of family-centered music therapy (FCMT) four years after participating in a 16-week home-based program. Their examination found long-term benefits to social relationships within the family, leading to perceived enrichment in child and family quality of life following music therapy sessions.



Mössler, K., Schmid, W., Aßmus, J., Fusar-Poli, L., & Gold, C. (2020). Attunement in music therapy for young children with autism: Revisiting qualities of relationship as mechanisms of change. *Journal of Autism and Developmental Disorders*, 50(11), 3921–3934. <https://doi.org/10.1007/s10803-020-04448-w>

This study was a follow up study of the TIME-A trial data to examine emotional and musical attunement between the child and therapist/caregiver on outcomes. Attunement involves relational matching and synchrony in order to share and communicate verbally and musically. The investigators found relational attunement was correlated with symptoms/acuity. Findings help refine music therapy treatment planning and better inform IEPs. Students with high levels of restricted and repetitive behavior, low IQ, and limited verbal language are more challenging to achieve relational attunement; however, the investigators confirmed the importance of addressing sensory and movement deviations as well as affective dysregulation. Music-based interventions can dynamically and flexibly attune music to all kinds of expression to musically relate to particularities of movement, sound, perception, and emoting (which define how these children communicate, relate, and make sense of their world). This study demonstrates music therapy when seen as a resource-oriented approach connecting to the children's strengths, and interpreting particularities as possibilities and capabilities rather than deficits. In this sense, music therapy may contribute to a neurodiversity view of autism.

Epstein, S., Elefant, C., & Thompson, G. (2020). Music therapists' perceptions of the therapeutic potentials using music when working with verbal children on the autism spectrum: A qualitative analysis. *Journal of Music Therapy*, 57(1), 66–90. <https://doi.org/10.1093/jmt/thz017>

This qualitative study explored music therapists' use of music and its therapeutic potential in work with children on the autism spectrum who have verbal skills. Three main themes were identified: (a) musical infrastructure, which describes how the music therapists facilitated musical experiences to support the children's ability to regulate their arousal, attention and emotions; (b) the meeting point between musical and verbal playfulness, which reflects the music therapists' beliefs about how musical experiences add vitality and support the development of both verbal and nonverbal imaginative play; and (c) musical responses, which describes the different ways music therapists use voice and songs to interact musically with verbal children. The importance of the therapist musically attuning to the child's emotional, physiological, creative, and playful qualities, even when the child has verbal skills is emphasized. Musical interactions (with attunement) help create a shared experience between the child and therapist that is perceived to help the child's different forms of regulation, continuity, and vitality.

West, R., & Silverman, M. J. (2020). Social Skills Instruments for Children with Autism Spectrum Disorder: A Critical Interpretive Synthesis. *Journal of Music Therapy*, thaa017. Advance online publication. <https://doi.org/10.1093/jmt/thaa017>

Understanding frequently used social skills psychometric instruments (SSPI) is relevant for the interdisciplinary teams in special education for consultation and communication on IEPs and for future music therapy research. This critical interpretive synthesis identified the SSPIs most frequently used as dependent measures in the *Journal of Autism and Developmental Disorders* (JADD) for children with ASD from 2012 to 2018. The Social Responsiveness Scale (n = 35), Autism Diagnostic Observation Schedule (n = 19), and Vineland Adaptive Behavior Scales (n = 15) were the most frequently used instruments. The authors then identified the psychometric properties and advantages and disadvantages of the 9 most commonly used instruments. To compare these results with the existing music therapy literature, the authors identified nonmusical SSPIs used as dependent measures in music therapy research for children with



ASD in studies published between 2012 and 2018. In comparing the data sets, music therapy researchers used 5 of the 9 SSPIs identified in the JADD review. These findings may better inform treatment planning and selection of SSPIs among disciplines and the interdisciplinary special education team.

Latif, N., Di Francesco, C., Custo-Blanch, M., Hyde, K., Sharda, M., & Nadig, A. (2021). Joint engagement and movement: Active ingredients of a music-based intervention with school-age children with autism. *NeuroRehabilitation*, 48(2), 167–185.
<https://doi.org/10.3233/NRE-208012>

An advantage of music therapy and music-based interventions is the ability to address multiple processes and domains concurrently (e.g., moving to music while interacting with the therapist). Two processes were measured in this study concurrently using coding with updated measurement technology: joint engagement and movement elicited by music-making. Compared to a non-music control intervention, children and the therapist in music therapy spent more time in triadic engagement (between child, therapist, and activity) and produced greater movement, with amplitude of motion closely linked to the type of musical instrument.

Emotion Regulation (ER)

Emotion regulation (ER) describes the goal-directed ability to manage and shape the dynamics and timing of one's emotional experiences and expressions, an ability that develops early in life. Maladaptive ER skills can significantly impact developmental outcomes, including readiness to learn.

Sena Moore, K., & Hanson-Abromeit, D. (2018). Feasibility of the Musical Contour Regulation Facilitation (MCRF) Intervention for preschooler emotion regulation development: A mixed methods study. *Journal of Music Therapy*, 55(4), 408-438. doi: 10.1093/jmt/thy014

Among at-risk children, the Musical Contour Regulation Facilitation (MCRF) intervention, a multi-session strategy for promoting ER development in preschoolers, resulted in positive change in children's behavior following the intervention in terms of their emotion skills and peer interactions.

Uhlig, S., Jansen, E., & Scherder, E. (2018). "Being a bully isn't very cool...": Rap & Sing Music Therapy for enhanced emotional self-regulation in an adolescent school setting: A randomized controlled trial. *Psychology of Music*, 46(4), 568-587. doi: 10.1177/0305735617719154

This study investigated a music therapy intervention (Rap & Sing Music Therapy) in a school-based program to understand support of self-regulation abilities and well-being among 8th graders in a public school. The music therapy intervention resulted in significant benefits in the experimental group compared to the control. There were improved effects on all measures which aligned with school interventions of motivational engagement in behavioral, emotional and social themes.

Specific Learning Disability

In addition to difficulties in phonological processing and cognitive deficits, children with specific learning disability (SLD) are known to have deficits in more innate non-language-based skills like musical rhythm processing. While a body of evidence exists, a recent study is noted, below.

Hande, V., & Hegde, S. (2021). Deficits in musical rhythm perception in children with specific



learning disabilities. *NeuroRehabilitation*, 48(2), 187–193. <https://doi.org/10.3233/NRE-208013>

This review of research examined rhythm deficits and rhythm-based intervention in children with SLD. The authors conclude, music and music therapy using rhythm-based interventions emerge as powerful intervention methods to target language processing and other neurocognitive functions. This holds implications and evidence for the important role of music therapists in adaptive music lessons in schools as well as music therapy using music-based interventions tied to rhythm-based interventions (e.g., neurologic music therapy techniques).

Behavioral and Mental Health

Layman, D. L., Hussey, D. L., & Reed, A. M. (2013). The Beech Brook Group Therapy Assessment tool: A pilot study. *Journal of music therapy*, 50(3), 155–175. <https://doi.org/10.1093/jmt/50.3.155>

This study tested reliability of a group therapy assessment instrument for use with children who have serious emotional disturbances. The assessment Instrument demonstrated excellent inter-rater reliability in measuring important behaviors of functioning central in the treatment of youth with severe and emotional disturbances. While the intended children were those severe enough to require placement in a residential or partial hospitalization treatment program, this article is cited, herein, as a potential tool in school settings here there may be a contained and dedicated class room for children with more involved behavioral and mental health conditions and where group therapy may be included as part of IEPs with school counselors, social workers, SPED teachers, and the interdisciplinary team.

Porter, S., McConnell, T., McLaughlin, K., Lynn, F., Cardwell, C., Braiden, H. J., Boylan, J., Holmes, V., & Music in Mind Study Group (2017). Music therapy for children and adolescents with behavioral and emotional problems: A randomized controlled trial. *Journal of Child Psychology and Psychiatry, and Allied Disciplines*, 58(5), 586–594. <https://doi.org/10.1111/jcpp.12656>

251 children (8-16 years) with social, emotional, behavioral and developmental difficulties and parent dyads from six Child and Adolescent Mental Health Service community care facilities in Northern Ireland were randomized to 12 weekly sessions of MT plus usual care [n = 76] or usual care alone [n = 105]. Follow-up occurred at 13 weeks and 26 weeks post-randomization. The primary outcome was improvement in communication (Social Skills Improvement System Rating Scales) (SSIS) at 13 weeks. Secondary outcomes included social functioning, self-esteem, depression and family functioning. Among participants aged 13 and over in the intervention group, the child SSIS communication was significantly improved but not the parent/guardian SSIS. Overall, self-esteem was significantly improved and depression scores were significantly lower at week 13. There was no significant difference in family or social functioning at week 13. Findings indicate good evidence for the use of music therapy but may also indicate the need for careful IEP coordination between the school-based teams, music therapist, and intervention design with the parent/guardian(s).

Geipel, J., Koenig, J., Hillecke, T. K., Resch, F., & Kaess, M. (2018). Music-based interventions to reduce internalizing symptoms in children and adolescents: A meta-analysis. *Journal of Affective Disorders*, 225, 647–656. <https://doi.org/10.1016/j.jad.2017.08.035>

This meta-analysis systematically quantified the effects of music-based interventions in reducing internalizing symptoms (i.e., depression and anxiety) in children pooling data across multiple randomized clinical trials. Greater reduction of internalizing symptoms was found in youth



receiving music-based interventions (n = 100) compared to control group interventions (n=95). Findings indicate that music-based interventions may be efficient in reducing the severity of internalizing symptoms in children and adolescents.

Other

Marrades-Caballero, E., Santonja-Medina, C. S., Sanz-Mengibar, J. M., & Santonja-Medina, F. (2018). Neurologic music therapy in upper-limb rehabilitation in children with severe bilateral cerebral palsy: A randomized controlled trial. *European Journal of Physical and Rehabilitation Medicine*, 54(6), 866–872. <https://doi.org/10.23736/S1973-9087.18.04996-1>

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This randomized controlled trial explored whether neurologic music therapy has an impact on the functionality of children with severe cerebral palsy. Significant improvements in the overall and specific "arm and hand position" as well as "activities" from the Chailey Levels of Ability and the locomotor stages were observed ($P < 0.05$) in the group which received music therapy. All these improvements persisted after four months. The control group showed no improvements after a four-month follow-up.

Chou, M. Y., Chang, N. W., Chen, C., Lee, W. T., Hsin, Y. J., Siu, K. K., Chen, C. J., Wang, L. J., & Hung, P. L. (2019). The effectiveness of music therapy for individuals with Rett syndrome and their families. *Journal of the Formosan Medical Association = Taiwan yi zhi*, 118(12), 1633–1643. <https://doi.org/10.1016/j.jfma.2019.01.001>

This pilot study investigated the effectiveness of music therapy on clients with Rett syndrome, as well as on parental stress for families of children with Rett Syndrome. Families in the study group were enrolled in a twice-weekly 120-minute music therapy program for 24 weeks (n = 11), compared to no music therapy (n = 12). Music therapy improved receptive language, verbal and non-verbal communication skills, and social interaction for RTT patients. In addition, purposeful hand function, breathing patterns, and eye contact were significantly improved. Of note, music therapy also decreased the frequency of epileptic seizures. Lastly, caregivers in the study group exhibited significantly lower stress following the program. This study may hold implications for caregivers in the school setting, as well.

Cassidy, C., Winter, P., & Cumbia, S. (2020). An interprofessional early childhood training program: Speech-language pathology and music therapy student outcomes and reflections. *Journal of Interprofessional Care*, 34(6), 819–821. <https://doi.org/10.1080/13561820.2019.1696761>

This mixed methods program evaluation examined interprofessional music therapy and speech language pathology services among early childhood students. The article illustrates the potential and benefits of co-treatment and may hold implications for school settings.

Boster, J. B., Spitzley, A. M., Castle, T. W., Jewell, A. R., Corso, C. L., & McCarthy, J. W. (2021). Music Improves Social and Participation Outcomes for Individuals With Communication Disorders: A Systematic Review. *Journal of Music Therapy*, 58(1), 12–42. <https://doi.org/10.1093/jmt/thaa015>

The goal of this systematic review was to explore social and participation outcomes for individuals with communication disorders who received arts-based interventions. The majority of identified studies (N = 71) utilized music. Results indicated that music-based interventions can improve social and participation outcomes, such as frequency of responses, initiation of communication, turn-taking, joint attention, and group participation for children and adults with autism spectrum disorder and developmental and acquired communication disorders.