

# **Critical Review: Is music therapy intervention an effective way to improve social communication skills in children with autism spectrum disorder (ASD)?**

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This critical review examines the evidence regarding music therapy (MT) intervention and its whether it is an effective way to improve the social communication skills of children who have been diagnosed with ASD. Study designs include randomized clinical trials (RCT), systematic reviews of RCTs, a phenomenological analysis and a mixed method multiple base line design. Overall, the evidence gathered in this review provides suggestive evidence that music therapy can improve some social communication skills in children with ASD. Recommendations for clinical practice and future research are also discussed.

## **Introduction**

According to the American Psychiatric Association (2018), Autism Spectrum Disorder or ASD is defined, as “a complex developmental condition that involves persistent challenges in social interaction, speech and nonverbal communication, and restricted/repetitive behaviors.” Children who are diagnosed with ASD struggle to communicate within social contexts, amongst other issues. Music therapy is used to help people communicate and express their feelings, and often addresses many of the primary problems that those who are diagnosed with ASD experience on a daily basis (Gold, Wigram, & Elefant, 2006).

The literature on this matter has been unclear as how music can influence the social communication skills of children with ASD. Music therapy and communication have the prospect of complimenting each other within therapeutic contexts, however analyses that combine these two approaches in the past have been limited (Geist, McCarthy, Rodgers-Smith, & Porter, 2008). Social communication is a key component in the development of a child’s language as well the promotion of friendships. An understanding of this evidence could provide Speech-Language pathologists (SLP) the opportunity to explore music within their therapy intervention, and would support them in making appropriate recommendations and referrals for treatment of children with ASD.

## **Objectives**

The primary objective of this review is to critically evaluate the literature regarding the impact of music therapy on communication skills of children with ASD.

The secondary objective is to provide clinical

recommendations regarding the use of music therapy in the practice of speech-language pathology, and provide suggestions for future research.

## **Methods**

### Search Strategy

Articles relating to this paper’s topic of interest were found using PubMed and Google Scholar. Keywords that were used during the database search were as follows:

[(Social Communication) AND (Autism) AND (Music Therapy) AND (Intervention)]

### Selection Criteria

Papers selected for inclusion were required to investigate the effects of music therapy on social communication (including joint attention, eye gaze, and initiation of communication) for preschool or school aged children (Ages 3-17). Further, participants were required to have a confirmed diagnosis of ASD.

### Data Collection

Papers included in this critical review are three RCTs (Level 1 evidence); two systematic reviews of RCT (Level 1+ evidence), a phenomenological analysis (Level 4 evidence) and a mixed method multiple base line design (Level 4 evidence).

## **Results**

**Thompson, McFerran, & Gold (2014)** conducted a parallel-randomized control trial with pre and post intervention data to examine the effects of family-centred, home-based music therapy on the social engagement of children with severe ASD. Twenty-three participants were chosen and randomized into one of two possible conditions: a family centred

music therapy (FCMT) program at home in addition to an early intervention program (n=12), or to early intervention only (n=11). Children in the treatment group were given one session of FCMT per week for 16 weeks conducted by a trained music therapist; sessions ranged from 30-40 minutes. A range of music therapy methods were used within each session.

Appropriate statistical analyses revealed no significant changes in the participants' speech or language skills. However, there was the indication that parents of the music therapy group perceived an improvement in their child's social interactions both at home and within the community. There was also significant improvement in the children's level of interpersonal engagement noted within the FCMT sessions themselves. Limitations of these findings, which were well documented by the authors include: small sample size and the use of parent reporting. The parent reports were unable to be blinded and therefore have the potential to be biased.

Overall, this paper provides suggestive evidence that although there is no significant impact on speech and language of the children with ASD, there was a noticeable improvement in social interactions perceived by parents following 16 weeks of FCMT in comparison to early intervention programs alone.

**Sharda et al. (2018)** conducted an RCT to investigate the outcome of music-based intervention on social communication, family quality of life and functional brain connectivity in school-aged children with ASD compared to a non-music control intervention. Fifty-one participants were divided randomly into two groups: children who received music therapy or the 'MT' group (n=26), and those who received a play based intervention with no music included, or the 'NM' group (n=25). Sessions were conducted over 8-12 weeks by the same accredited therapist and involved 45-minute individual sessions per week. MT sessions used rhythmic cues, instruments and songs to target communication, turn taking, and social appropriates. NM sessions were designed to be a play-based comparison to control for non-specific factors.

Appropriate statistical analyses showed that improvements specific to pragmatics, reductions in inappropriate initiations and better social relations were found from baseline to post-intervention on the Children's Communication Checklist (CCC-2) of the MT group. However, there were no significant improvements noted on either the Social Responsiveness Scale (SRS-II), or the Peabody

Picture Vocabulary Test (PPVT-4) post intervention. Strengths of this study included appropriate randomization and allocation blinding, as well as successful blinding of both subjects and assessors. However, weaknesses include a small sample size, and only partial blinding of parents.

Overall this paper provides suggestive evidence that 8-12 weeks of music intervention in comparison to intervention without music can improve parent-reported social communication skills in children with ASD.

**LeGasse (2014)** conducted an RCT to examine the effect music therapy had on eye gaze, joint attention and initiation of response to communication, as well as the parental reporting of social skills in children with ASD in comparison to those who received no music intervention. Seventeen participants (4 female, 13 male, aged 6-9) were randomly allocated to either a music therapy group (MTG) (n=10), or a no-music social skills group (SSG) (n=12) and participated in sessions for 50 minutes twice a week for 5 weeks.

Appropriate statistical analyses revealed a significant difference between the MTG and SSG groups for SRS scores, with the MTG group having more improvement in social responsiveness. This result suggests that parents recognized an improvement in social behavior following treatment. There was no significant difference found on the Autism Treatment Evaluation Checklist (ATEC). The MTG group showed increased eye gaze and joint attention in session 10, which is consistent with other research. However, there was no demonstrated improvement on initiation of communication. Limitations to this study include a very small sample size, objective rating scales – allowing potential parent bias, no sibling or parent training, which could have resulted in practice outside of sessions, and an attrition rate of 22%. Strengths include: detailed selection criteria and comprehensive breakdown of outcome measures pertaining to social communication.

This study provides suggestive initial evidence that musical intervention may improve skills such as eye gaze and joint attention. It also suggests that intervention improves overall parental perception of the social communication skills in those children with ASD who participated in music therapy.

**Geretsegger et al. (2016)** completed a systematic review of the evidence surrounding music therapy and its effect on the social communication of individuals with ASD.

An electronic search was conducted to find articles using 10 databases with a clearly defined search strategy. Two reviewers investigated articles independently and data was extracted using a data collection form. The search method used was appropriate given the study design. There was also proper assessment of the risk of bias within the studies found. Their search eventually revealed 10 studies with 165 total participants (ages 2 through 9 years old) that examined both short and medium-term effects of music interventions ranging from 1 week to 7 months.

Analysis of the data revealed that music therapy in comparison to a 'placebo' is superior with respect to outcomes in social interactions both within and outside of the therapy context, and non-verbal social skills within the therapy context. There was, however, no significant difference in non-verbal skills outside of therapy. Limitations of this evidence include: the varying small sample sizes of the 10 studies (ranges from 4 to 50 participants) and the small total number of participants. The review also mentions that only some of the outcomes used published measurement tools, which could affect the replication of these findings.

Overall, this review provided suggestive evidence that music therapy may improve both verbal and non-verbal social communication skills of children with ASD.

**Maw & Haga, (2018)** completed a systematic review and meta-analysis of the current evidence surrounding interventions used for preschool aged children with ASD. Electronic databases were used to search for articles with RCTs with outcome measures related to communication, behaviour and cognitive skills. Out of the initial 5174 identified studies, 14 were included in the final review, and 3 studies of music therapy interventions provided the highest outcome effects.

Appropriate analysis of the data revealed that the outcome effects of music therapy were greatest when intervention time was shorter and lower in intensity. The quality of the health care provider also played a role in treatment effectiveness. Major improvements that were reported included: parent-child relationship, speech and language production, joint attention and non-verbal social communication. However, limitations to this review included: studies having a broad range of interventions, which caused scattered outcome measures as well as a limited scope of articles (articles before 2001 and after 2015 were not

incorporated for review).

Despite these limitations, overall this review provided suggestive evidence that music therapy intervention may help increase the social adaptation skills in children with ASD.

**Vaiouli, Grimmet & Ruich, (2015)** conducted a mixed method, multiple base line design to determine the effect of improvisational music therapy intervention on three children with ASD. The three phases of this intervention included specific social skills: focus on faces, initiation of joint attention and response to joint attention. Complimentary qualitative analyses of parent and teacher experiences were done to provide a more in-depth understanding of the role the social environment plays on emerging communication skills. The participants included were three children of Caucasian descent with ASD; ages ranging from 5 to 7 years. Each participant received individualized music therapy sessions by a board-certified music therapist weekly for approximately 30 minutes. Each session incorporated four specific components: a welcome song, a child led portion, an adult led portion and a goodbye song.

Appropriate data analysis showed that overall all three participants demonstrated increased levels of focusing on faces as well as responding and initiating joint attention. Qualitatively, teachers noticed changes in the children's communicative actions and attributed them to the music intervention, thus indicating potential transferability across settings. However, there are limitations to this study, which include extremely small sample size, limited follow up and lack of a control group.

Due to these circumstances this study provides highly suggestive evidence that gains in social communication and engagement of children with ASD could be facilitated through music therapy intervention.

### **Conclusions and Clinical Implications**

Overall, the findings from these studies indicate initial evidence that there is a potential link between music therapy intervention and the improvement of social communication skills of children diagnosed with ASD. However, the decreased sample sizes and lack of consistent methods of musical intervention reduce the strength of the evidence and capacity to definitively apply the findings within a clinical setting.

A common theme that was revealed through this review was that parents had an increased perception of their child's social abilities post music therapy intervention. Thompson (2017) mentions that parents noted their children had developed vocabulary and gestures, as well as improvements in social engagement after participating in music therapy. Parents also mentioned that music therapy allowed for them to learn new ways to engage their children at home and created more opportunities for interaction.

This secondary outcome proves to be positive and could help open the door to more social communicative success. If parents are able to create more opportunities to communicate and engage with their children, this could potentially enhance the use of social communication skills within the home, which ultimately could lead to the transferring of this skill into other contexts.

### Recommendations

Due to the limited sample sizes, and very broad range of interventions used within the research reviewed it is recommended that clinicians be cautious when applying the findings of these studies. While this current critical review did not find a compelling level of evidence between music therapy intervention and the social communication skills of children with ASD, there is suggestive initial evidence that there could be positive connection between the two.

More research in this area is encouraged to provide stronger evidence to support the use of music therapy intervention in children with ASD. In order to increase the confidence of clinical implications as well as the generalizability of the current results, future research should focus on recruiting more participants.

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