NDIS Independent Review of Pricing of Art and Music Therapy

Submission by the Australian Music Therapy Association (AMTA) to the Independent Reviewer: Dr Stephen Duckett AM

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Context

On 22 November 2024, the AMTA were notified through an unauthorised leak from the NDIA that it planned to release reviewed Operational Guidelines that would specify a funding cut for music therapy. Without consultation or notice, the NDIA had intended to remove music therapy as a therapy support at a price limit of $193.99 per hour and instead fund music programs under Participation in Community, Social and Civic Activities, which has a price limit of $67.56 per hour.

[redacted]

In making this decision, the NDIA quoted that music therapy does not have sufficient evidence to satisfy the section 10 requirements for what constitutes an evidence-based therapy support in relation to the maintenance or improvement of functional impairment.

Despite several requests, the NDIA has not provided AMTA with the evidence upon which the initial decision was made. Formal requests for information under the Freedom of Information Act 1982 have also not been fulfilled at the time of lodging this submission.

Australian Music Therapy Association

The Australian Music Therapy Association (AMTA) is the government-recognised peak body advocating for access to music therapy and representing up to 900 registered music therapy professionals across Australia.

AMTA is the only government recognised national certifying body for music therapy professionals. AMTA is a member of Allied Health Professions Australia and the National Association for Self-Regulating Health Professions (NASRHP). AMTA has clearly defined membership criteria, national professional standards and assessment processes and a clearly defined scope of practice. Music therapists registered with AMTA are required to comply with strict regulatory standards established by NASRHP to ensure consumer safety.

NASRHP standards align closely with the **Australian Health Practitioner Regulation Agency (AHPRA)** regulatory standards, ensuring high standards of professional competency, ethical practice, and ongoing professional development across self-regulating allied health disciplines. Both frameworks require practitioners to meet rigorous entry-level education, adhere to professional codes of conduct, and engage in continuing professional education to maintain their credentials. However, AHPRA's regulatory model is designed to **minimise risk to the public**, and this informs its decision on which health disciplines require statutory regulation. Professions regulated by AHPRA typically involve a higher degree of inherent risk to patient safety, requiring legally enforceable standards, while NASRHP provides robust self-regulation for disciplines where risk is effectively managed through professional governance and industry standards.

Our highly skilled professional workforce

AMTA accredits the only two courses in Australia, classed as Australian Qualification Framework Level 9, that lead to full registration with the AMTA as a registered music therapist (RMT). Both these courses qualify individuals who apply an advanced body of knowledge in a range of contexts for professional practice as a music therapy professional and are a pathway for further learning. The Master of Music Therapy program is offered at the University of Melbourne and the Master of Creative Music Therapy at Western Sydney University.

Music therapists are employed across hospitals, primary care, educational settings, aged care, disability providers, justice health, specialist clinics, mental health services and universities nationally. 85% of the workforce is female. Music therapy professionals are a growing workforce in Australia with the graph below (figure 1) outlining two-fold increase in graduates since 2013. Music therapy's growth has recently been reported by Job Skills Australia and recognised through allocation of a unique occupation code in the recent Australian Bureau of Statistics ANZSCO Review.

Registered music therapists are included in every state and territory's employment awards and/or enterprise agreements and are included in allied health professional policies, programs and position papers. Music Therapy Professionals are also included in a range of State and Commonwealth funded programs in recognition of their role in achieving functional outcomes for patients, consumers, clients and residents. The federal government has committed over $13M to researching the role of music therapy and its impacts across the last 20 years (see attachment A). Pilot funding also announced by the Minister of Arts, Hon Tony Burke, includes $4.2M for music and art therapy via Revive: Australia's Cultural Policy to determine the demand for and impact of PHN-commissioned music and art therapy programs.

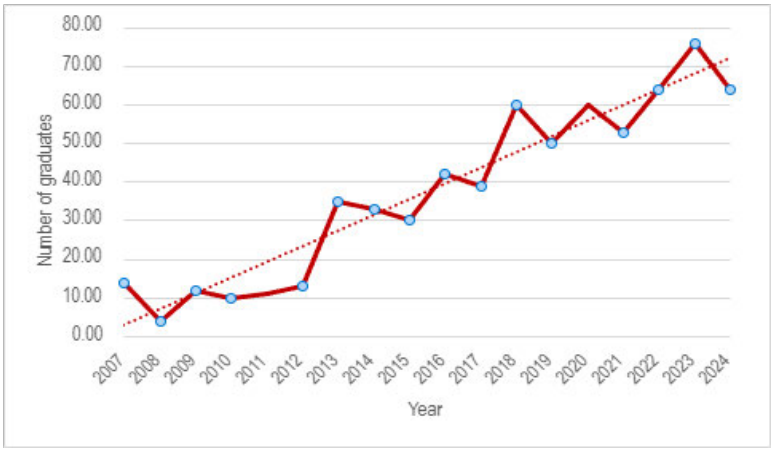

Figure 1. Graph depicting growth in music therapy graduates

Key features of music therapy

What is music therapy?

AMTA defines music therapy as:

“an evidence-based allied health profession. Music therapy is the intentional and therapeutic use of music by registered music therapists (RMTs) to support people to improve their health, functioning and wellbeing. Music therapy provided by a registered music therapist improves health outcomes, experiences and quality of life for people and their carers. Evidence shows music therapy improves:

- mental health and wellbeing
- speech, communication and social skills
- body movement, coordination and physical function
- memory, attention and cognitive function
- pain management

Music therapists support people of all ages, abilities and backgrounds.”

AMTA’s definition aligns internationally in its **evidence-based, professional, and therapeutic approach** but is distinct in its **explicit classification as an allied health profession** and **specific focus on measurable outcomes, influenced by Australia’s healthcare system and policy contexts.** It sits at the intersection of **clinical, rehabilitative, and developmental approaches**, bridging the perspectives of the **American Music Therapy Association’s goal-based model, the British Association of Music Therapy’s psychological framework, and Music Therapy New Zealand’s holistic approach**.

This definition aligns with the broader literature, which describes music therapy as "a systematic process of intervention wherein the therapist helps the client to promote health, using musical experiences and the relationships that develop through them as dynamic forces of change" (Bruscia, 1998, p. 20). The evidence base for music therapy demonstrates its utility across a wide range of applications, from supporting individuals with autism spectrum disorder (ASD) through family-centered approaches (Geretsegger et al., 2022) to aiding rehabilitation for acquired brain injury using rhythmic auditory stimulation and music-based emotional interventions (Magee et al., 2017).

Differentiation from other music activities

Music therapy is a structured, evidence-based therapeutic practice conducted by accredited professionals who use music to achieve specific health or developmental outcomes within a clinical framework. In contrast, general music activities, such as community music-making or recreational singing, may have incidental health benefits but lack the tailored, goal-oriented interventions characteristic of music therapy. Conflating music activities and music therapy can be harmful,

particularly in settings where participants with cognitive or other behaviour conditions are seeking to improve their functional capacity.

Short and MacRitchie (2023) emphasise that music therapy occupies a distinct node in the broader music-health continuum, see figure 2, requiring professional training and assessment to address individual needs therapeutically. Morell and Shoemark (2018) also highlight the unique contributions of music therapy in fostering specific parent-child interactions or supporting vulnerable populations, distinguishing it from other music-based activities rooted in broader educational or community objectives. Edwards (2015) further underscores the rigorous professional identity of music therapists, whose clinical interventions are recognised and regulated to ensure efficacy and client safety.

This distinction is essential for clarity in service delivery and policy development, ensuring that the unique contributions of each type of music engagement are recognised and appropriately applied.

Figure 2. Continuum of music for health and wellbeing (Short & MacRitchie 2023; Thompson et al., 2015)

Evidence of benefit of music therapy in improving disability-related functional capacity

In response to the request to provide evidence of the benefit of music therapy, we have collated 118 relevant peer-reviewed references and summarised data from 50 practice evaluation reports previously submitted to the NDIS for a participant's plan review (see Appendix 1 for full report).

This summary contextualises the evidence base for music therapy in relation to the NDIA's functional capacity areas as follows:

- **Functioning (including psychosocial functioning):** How you learn, understand and remember new things, and practise and use new skills. Self-management, including how you organise your life. How you plan, make decisions, and look after yourself. This might include day-to-day tasks at home, how you solve problems, or manage your money. We consider your functional ability/mental or cognitive ability to manage your life, not your physical ability to do these tasks.
- **Language and communication:** How you speak, write, or use sign language and gestures, to express yourself compared to other people your age. How well you understand people, and how others understand you.
- **Interpersonal interactions:** Socialising, including how you make and keep friends, or interact with the community, or how a young child plays with other children. We also look at your behaviour, and how you cope with feelings and emotions in social situations. For example, people experiencing psychosocial disability may experience social avoidance and difficulty accessing the community.

- **Mobility and movement:** How easily you move around your home and community, and how you get in and out of bed or a chair. How you get out and about and use your arms or legs.
- **Community living:** Your capacity to live independently in the community. This includes your living skills, money and household management, social and communication skills and behaviour, as well as home modifications.
- **Personal care:** Self-care, hygiene, grooming, eating and drinking, and health. How you get dressed, shower or bathe, eat or go to the toilet.

Music therapy disability research evidence is **international**, and therefore the key terms and outcome measures are often specific to each study. The heterogenous nature of disability means that replication studies are uncommon, and meta-analyses are limited to more medically oriented research. Further, research projects often focus on more than one of the NDIA functional capacity areas, since therapy goals can be relevant across functional areas. This diversity of disability research is common across all allied-health disciplines.

We have therefore **collated and categorised a selection of the relevant research** related to the NDIA's defined areas of functional capacity. The evidence-base is collated from a music therapy viewpoint and includes qualitative and quantitative data that has been examined using a range of research designs including meta-analyses of RCTs, pre-post testing, interview analysis, video analysis, and mixed methods.

The summary is **descriptive**, and the reference list is **not exhaustive**. Therefore, the selected evidence aims to show the **breadth and depth** of the evidence-base for music therapy that informs practice with NDIS participants.

The summary is supported by **appendices** that provide lists of references collated within each functional capacity area. Given the multi-area focus of most of the research, we have transparently provided the references in two formats in the appendices. The first format is a full reference list with each citation only appearing once, and with the key features of each reference itemised in the table (see Appendix 2). The second format provides a separate reference list for each functional capacity area, along with the additional relevant areas for each citation (see Appendices 3-8).

Functioning (including psychosocial functioning)

Cognitive and psychosocial skills are required for children and adults to perform any purposeful thoughts and behaviours required in everyday life and thus are critical to functioning. Cognitive skills include attention, memory, logic and reasoning, auditory and visual processing, and executive functions, while psychosocial or mental skills refer to a person's capacity to learn, interact with others, self-express, reason and respond to challenges, and make positive life choices.

Research-based evidence (see Appendix 3)

This is a well-developed area of research and practice in music therapy and a total of 79 references exploring the role of music therapy to improve functioning as measured by cognitive and psychosocial skills have been categorised for this submission. These studies explore music therapy interventions with people living with neurological (28), psychosocial (22), cognitive (13), intellectual (6), physical (6),

and sensory (4) impairments as defined by the NDIA-related impairment domains. The selected references include music therapy research with people of all ages including infants and children (23), adolescents and young adults (31), adults and older adults (38). Systematic reviews including mixed age participants are also included (10).

There are 35 systematic reviews or meta-analyses that are relevant to this area, along with 14 randomised controlled trials and 16 pre-post, non-randomised and mixed method studies. 9 case studies and 5 qualitative studies are included. Both individual and group work is represented in the research evidence.

A range of music therapy methods, techniques and interventions are examined in the research literature, including therapeutic singing and instrument play, rhythmic cueing, music assisted storytelling, dyadic improvisations, receptive methods, therapeutic song writing and composition, music and movement, and musical play.

Research evidence shows a range of outcomes relevant to this domain across various focus areas that relate to functioning, including global cognition, attention, memory, recall, auditory discrimination, music engagement, depression, anxiety, mood, and apathy.

Practice-based evidence

From the analysis of the 50-music therapy reports previously submitted to the NDIS for a participant's plan review, the domain Functioning was addressed by music therapy goals in 74% of cases. An overview of the music therapy goals and objectives related to Functioning is provided below:

Functional domain	**MT goal area**	**Example goals/objectives**
Functioning (including psychosocial functioning)	Executive functioning	• Following multi-step instructions • Sustained and focused attention • Increasing concentration span • Decision-making, problem solving • Task completion, dual tasking • Learning • Working memory, retaining information • Auditory processing • Capacity to navigate complex cognitive tasks and demands • Attainment of age-appropriate milestones • Participation at school/in academic and vocational pursuits
	Psychosocial functioning	• Emotional stability and regulation (e.g. identify, express and regulate feelings and emotions) • Music-based strategies for self-management of anxiety, mood, reducing distress • Arousal regulation

		• Behaviour regulation (e.g. reduce head-hitting behaviour) • Strategies to assist in managing complex behaviours in daily life • Independence, self-confidence (trying new things, choice-making) • Self-regulation in social, community and education environments • Participation at school/in academic and vocational pursuits
Excerpt from Table 3, Appendix 1		

Across the 50 reports summarised, a total of 135 out of 363 outcomes of music therapy interventions were reported related to Functioning. Thematic analysis revealed that across all reports, goals were typically met or partially met, but with further therapeutic intervention recommended due to the complex and ongoing nature of participants' disabilities (see Appendix 1, Figure 2 and Table 6).

Case-example videos and vignettes

The video clips presented highlight the many ways in which qualified music therapists support NDIS participants of different ages and abilities to develop their functioning (including psychosocial functioning). The clinical outcomes evidenced show enhanced executive functioning, coordination of movement and improved sensory-motor skills. The videos illustrate how music therapy in clinical practice, can support motor planning and problem solving. This demonstrates how music therapy contributes to increasing the functional ability, ability to manage feelings and support participants to function in day-to-day life (see Appendix 9).

Language and communication

Qualified music therapists support NDIS participants in their language and communication capacity in unique ways since music-based therapeutic techniques can enhance the participants' motivation to communicate and tap into their interest areas. The language and communication domain covers diverse functional capacities including how a person speaks, writes, or uses sign language and gestures. This domain also includes the participants' capacity to understand other people.

Research-based evidence (see Appendix 4)

Music therapy evidence demonstrates improvements in a range of functional language and communication domains. Improvements for people who will be able to develop or recover language are obviously more amenable to quantitative measurement. This is seen by significant improvements in people with aphasia after music therapy as demonstrated through meta-analysis (Liu et al, 2022), RCTs (Raglio, 2016) as well as smaller sample designs such as case series (Hurkmans et al, 2015). However, communication outcomes become less oriented towards language and more focused on non-verbal and social communication with other participants. For example, functional communication

outcomes were identified in 25/30 articles reviewed in a meta-analysis of music therapy research about children and adolescents with neurodisabilities (primarily children with traumatic brain injury).

Children and adolescents with autism have been the focus of most research in language and communication (21 of 49 citations), with improvements in social and non-verbal communication being demonstrated using a range of research designs including RCTs (Sharda et al 2018; Gattino et al 2011), and meta-analyses, but authors often need to qualify their claims due to limited samples and design limitations (Gassner et al 2021; Vaiouli et al 2017).

Findings of functional communication outcomes in the areas of profound and multiple disability are qualitative in nature, with interpretation of video and musical data revealing subtle improvements (Lee et al, 2012; Thompson et al, 2014; Graham, 2004) that would be celebrated by family and carers as meaningful and important, but not quantitatively measurable. Similarly, functional communication goals are described in qualitative investigations of music therapy with adults who have chronic mental illness such as major depressive disorder (Windle et al 2020) and improvements in negative symptoms have been demonstrated that result in increased communication for people with schizophrenia (Tseng et al 2016), but not quantifiable changes in language.

Most research has focused on individual music therapy, with fewer focusing on group work (6). Live musical encounters were by far the most common, with the music therapist playing a scaffolding instrument such as guitar/piano to support and encourage the playing and singing of participants. Songs were used to promote language (both writing and singing) and instruments were used to promote non-verbal and social communication.

Practice-based evidence

From the analysis of the 50-music therapy reports previously submitted to the NDIS for a participant's plan review, the domain Language and Communication was addressed by music therapy goals in 72% of cases. An overview of the music therapy goals and objectives related to Language and Communication is provided below:

Functional domain	MT goal area	Example goals/objectives
Language and communication	Expressive language	• Increase spontaneous speech output • Production of words/phrases • Imitation/repetition of phrases and sounds • Functional vocabulary • Learning/using non-verbal communication (e.g. AAC, keyword sign, gestures)
	Receptive language	• Improve ability to follow instructions • Improve ability to respond to questions • Improve listening skills • Improve joint attention
Excerpt from Table 3, Appendix 1		

Across the 50 reports summarised, a total of 106 out of 363 outcomes of music therapy interventions were reported related to Language and Communication. Thematic analysis revealed that across all reports, goals were typically met or partially met, but with further therapeutic intervention recommended due to the complex and ongoing nature of participants' disabilities (see Appendix 1, Figure 2 and Table 6).

Case-example videos and vignettes

There are shared mechanisms underlying rhythm processing in music and speech and language processing. These cognitive and sensorimotor mechanisms suggest music therapy is a suitable therapeutic support for individuals with speech and communication challenges. The videos provided (see Appendix 10) illustrate the clinical outcomes and impact of music therapy on communication development, including: eliciting first words in children with severe expressive language delays; recovering speech following stroke or brain injury; developing functional speech in individuals with dyspraxia and autism; enhancing non-verbal and multi-modal communication; increasing vocal volume and articulation; and facilitating reciprocal communication.

Interpersonal Interactions

Interpersonal interactions relate to the functional domain of socialising. The NDIA documents state that this domain includes how a participant makes and keep friends, or interacts with the community, or how a young child plays with other children. This domain includes capacity related to behaviour, and how participants cope with feelings and emotions in social situations. Challenges with interpersonal interactions may lead to social avoidance and difficulty accessing the community.

Research-based evidence (see Appendix 5)

This is a key area of music therapy practice and research, with research examples from 2001 onwards selected for this summary. Research evidence in this domain includes a range of focus areas that relate to interpersonal interactions, including: regulation (emotional, arousal, and sensory-motor); social communication; socialisation; social awareness and engagement; interactive play skills; imitation; social motivation; empathy and emotional understanding; social behaviours; and sustaining friendships/relationships.

A range of music therapy methods, techniques and interventions are examined in the research literature, including: dyadic improvisations; engaging in structured music compositions; music listening; therapeutic song writing and composition; music and movement; and musical play.

We categorised 54 references that are relevant to the area of interpersonal interactions. Within these citations, participants with primary impairments of either neurological or psychosocial types are the most common (18 and 16 citations respectively), and research with children and adolescents is prominent (32 citations). There are 19 systematic reviews or meta-analyses that are relevant to this area, along with 10 randomised controlled trials and 8 pre-post or quasi randomised studies. A further 6 case studies and 4 qualitative studies are represented. Both individual and group work is represented in the research evidence.

Practice-based evidence

From the analysis of the 50-music therapy reports previously submitted to the NDIS for a participant's plan review, the domain Interpersonal Interactions was addressed by music therapy goals in 56% of cases. An overview of the music therapy goals and objectives related to Interpersonal Interactions is provided below:

Functional domain	MT goal area	Example goals/objectives
Interpersonal interactions	Social skills	• Turn-taking • Matching/responding, following/initiating • Extending joint attention • Social play with peers • Socially appropriate behaviours • Social independence & confidence
	Emotional regulation	• Support levels of co-regulation • Support self-regulation • Skills and strategies to manage emotions in social situations (e.g. calming strategies, understanding emotions, communication/sharing)
	Social interactions/ relationships	• Participation • Collaboration • Healthy relationships • Meaningful social interactions • Accessing the community
Excerpt from Table 3, Appendix 1		

Across the 50 reports summarised, a total of 83 out of 363 outcomes of music therapy interventions were reported related to Interpersonal Interactions. Thematic analysis revealed that across all reports, goals were typically met or partially met, but with further therapeutic intervention recommended due to the complex and ongoing nature of participants' disabilities (see Appendix 1, Figure 2 and Table 6).

Case-example videos and vignettes

The video examples presented (see Appendix 11) highlight the diverse ways in which music therapy develops interpersonal connections and social engagement across different ages and abilities. The clinical outcomes evidenced show enhanced confidence and improved social skills, including shared play, turn-taking, imitation, joint attention, and emotional regulation. The videos, captured in music therapy sessions, illustrate how music therapy in clinical practice, can support the understanding of social roles, enhance flexible thinking and reciprocity in interactions. Additionally, the therapeutic use of music provides a predictable yet dynamic environment that encourages participation, self-expression, and relational connection.

Mobility and movement

Movement and mobility refer to an individual's ability to navigate their environment to complete everyday tasks. The NDIA describes this domain as including movement within the home and community, as well as the ability to perform physical activities that support independence and participation. For children, mobility plays a crucial role in early development, enabling engagement in play, social interactions, and environment exploration. Limitations with movement and mobility can affect access to education, employment, recreation, and broader community participation.

Research-based evidence (see Appendix 6)

Music therapy research collated for this review related to mobility and movement spans more than two decades. Studies focus on gait rehabilitation, postural control, motor coordination, balance, and both fine and gross motor function, as well as how movement skills are acquired and refined through motor learning. Music therapy movement interventions utilise rhythm and multimodal sensory cues (e.g. auditory, tactile, visual) to enhance movement timing, improve efficiency, and support functional mobility in daily activities.

A total of 26 citations exploring the role of music therapy in improving movement and mobility functional capacity have been selected for this summary. These studies explore music therapy movement interventions for people experiencing impairments in the NDIA-related domains of neurological functioning (18 citations), physical functioning (5 citations) and cognitive functioning (3 citations).

The selected references focus on acquired brain injury (6), cerebral palsy (5), Parkinson's (3), stroke (2), autism (2), Rett syndrome (2), and multiple sclerosis (1). Additionally, 5 references that provide broader conceptual and theoretical underpinnings for neuro and physical disability are included (Devlin, Alshaikh, & Pantelyat, 2019; Thaut, McIntosh, & Rice, 2015; Twyford et al., 2024; Weller & Baker, 2011; Wheeler, Shiflett, & Nayak, 2003).

This evidence base includes 4 controlled studies (randomised and non-randomised), and 16 reviews (meta-analysis, systematic, scoping, integrative, narrative and conceptual). Additionally, 4 pre-post investigations and 2 case studies that include an exploration of individual experiences and therapeutic outcomes have been included.

Research in this area encompasses both individual and group music therapy approaches, applied across settings such as rehabilitation clinics, community-based programs, and educational environments. Key music therapy interventions documented in the selected literature include rhythmic auditory cuing for movement facilitation, rhythmic auditory stimulation (RAS) for gait training, patterned sensory enhancement (PSE) for structured movement sequences, therapeutic instrumental music performance (TIMP) for upper limb function, Neurologic Music Therapy (NMT) more broadly, and movement-to-music interventions designed to enhance motor control and coordination.

Practice-based evidence

From the analysis of the 50-music therapy reports previously submitted to the NDIS for a participant's plan review, the domain Mobility and Movement was addressed by music therapy goals in 26% of

cases. An overview of the music therapy goals and objectives related to Mobility and Movement is provided below:

Functional domain	MT goal area	Example goals/objectives
Mobility and movement	Fine motor skills	• Improve pincer grasp • Increase finger dexterity and strength • Increase frequency of bilateral hand movements • Strengthen hand muscles • Sustain hand use for functional movement tasks • Improve manipulation of instruments
	Gross motor skills	• Increase balance • Improve gait confidence • Improve coordination • Improve posture
	Range of movement	• Increase arm reach • Improve muscle strength
Excerpt from Table 3, Appendix 1		

Across the 50 reports summarised, a total of 35 out of 363 outcomes of music therapy interventions were reported related to Mobility and Movement. Thematic analysis revealed that across all reports, goals were typically met or partially met, but with further therapeutic intervention recommended due to the complex and ongoing nature of participants' disabilities (see Appendix 1, Figure 2 and Table 6).

Case-example videos and vignettes

The video clips selected highlight that for individuals with complex physical challenges, music therapy techniques utilising preferred instruments enhances motor planning, manipulation of objects, and coordination of movement (see Appendix 12). These mobility and movement outcomes support functional transfers to activities of daily living. Clinical outcomes from the selection of video available demonstrate that rhythm-based auditory stimulation improves gait, balance and walking patterns and sustained and co-ordinated movement. Additionally, structured movement-based interventions supporting neurodevelopmental, neurocognitive and neurodegenerative conditions, aid the development of controlled and co-ordination movement while promoting engagement and generalisation of improved motor skills. These clinical applications highlight music therapy's role in developing sensorimotor integration, enhancing movement regulation, and supporting functional mobility.

Community living

This domain relates to participants' capacity to live independently in the community, including capacities such as money and household management, social and communication skills and behaviour, as well as home modifications. This domain could be viewed as related to several other

capacity areas. For example, cognitive functioning and psychosocial functioning will impact community living.

Research-based evidence

Given the overlap of this NDIA domain with other domains, isolating the relevant research literature is challenging. We offer examples of six studies where community living was one aspect of the research domains being measured (see Appendix 7).

Practice-based evidence

From the analysis of the 50-music therapy reports previously submitted to the NDIS for a participant's plan review, the domain Community Living was addressed by music therapy goals in 8% of cases. Due to the small number of goals and objectives relevant to music therapy, no further analysis is provided.

Personal care

This domain relates to participants' capacities for self-care, hygiene, grooming, eating and drinking, and health. Similar to the Community Living domain, these capacities are related to several other domain areas. For example, cognitive functioning and psychosocial functioning will impact personal care.

Research-based evidence

Given the overlap of this NDIA domain with other domains, isolating the relevant research literature is challenging. We offer examples of two studies where personal care was one aspect of the research domains being measured (see Appendices 8).

Practice-based evidence

From the analysis of the 50-music therapy reports previously submitted to the NDIS for a participant's plan review, the domain Personal Care was addressed by music therapy goals in 6% of cases. Due to the small number of goals and objectives relevant to music therapy, no further analysis is provided.

Case-example videos and vignettes

The video examples presented (see Appendix 13) highlight the diverse ways in which qualified music therapists assist participants of all ages and abilities to learn and complete personal care tasks and activities of daily living (ADLs). Music therapist often write songs tailored to individual needs to teach and reinforce key points and sequential steps in personal care tasks. Such songs usually incorporate participant musical preferences to maximise motivation and engagement. Specific examples of songs written in music therapy include: putting on shoes, brushing teeth, getting undressed, showering, tying shoelaces, applying sunscreen, and walking safely. These examples collectively demonstrate how music therapy contributes to strengthening independence in personal care and supporting individuals to navigate daily activities with increased confidence.

Impacts of Changing NDIS Operational Guidelines

Replacing Therapy Supports with Participation: A Decision Disregarding the Importance of Compassion

The NDIA proposed to replace music therapy with social and community participation, which does not require delivery by registered music therapists and will not achieve the same positive, functional outcomes. The proposed changes fundamentally disregard the individual needs, dignity, and rights of people with disabilities. This change is not just a technical reclassification—it is a decision that disregards the importance of compassion for those who rely on evidence-based, therapeutic interventions to improve their quality of life.

Comparative example. Replacing physiotherapy with outdoor activity participation

A young person with limited mobility following a traumatic brain injury is accessing physiotherapy supports to improve lower limb function to be able to mobilise independently. While participation in a community walking group may benefit the young person in terms of their social connections and participation, it will not achieve the same functional outcomes as physiotherapy. Allied health therapy delivers functional outcomes; community participation does not. The same is true for music therapy, an allied health profession.

Music therapy is not simply an opportunity for social participation; it is a lifeline for many NDIS participants who experience significant challenges with communication, motor function, emotional regulation, and social connection. To equate clinical music therapy with general recreational activities fails to acknowledge the complex needs of these individuals and devalues the impact of specialised therapeutic interventions.

This approach disregards the importance of empathy and foresight that must underpin disability policy. People with disabilities deserve more than a minimal, cost-driven approach to care—they deserve a system that recognises their individual needs, listens to their voices, and values interventions that support their dignity, independence, and well-being.

AMTA urges the NDIA and the Independent Reviewer to **act with compassion** and retain music therapy within Therapy Supports, ensuring participants continue to receive the targeted, evidence-based interventions they need to thrive.

NDIA proposed fee structure is unsafe and unsustainable

The suggested pricing includes a 1 to 1 rate of $67.56 per hour and a group rate of $193.99 per hour for a minimum of 4 participants. However, for many participants with high support needs i.e. children with autism or behavioural concerns, group therapy sessions are unsafe and inappropriate, as they require individualised programs to address their goals. The proposed rates are not realistic for private

practice providers and will impact the availability of music therapy in the NDIS, resulting in limited or no access to music therapy for many participants.

Pricing Considerations

The Australian Music Therapy Association (AMTA) emphasises the importance of, at least, maintaining the current price limit of $193.99 per hour for individualised music therapy sessions under the NDIS. Key evidence and arguments for preserving this rate include:

1. **Specialised Cost Structures**:
    a. Registered Music Therapists (RMTs) are highly qualified, often holding postgraduate degrees and certifications comparable to other allied health professions. These advanced qualifications incur significant upfront and ongoing costs, including supervision, registration and professional development.
    b. Music therapy requires substantial investment in specialised resources such as musical instruments, which entail high purchase, maintenance, and insurance costs.
    c. Economic modelling undertaken by Deloitte in 2021 noted the cost of service provision for non-psychology therapy supports was $200.79 per hour.
2. **Operational Challenges and Rising Costs**:
    a. Music therapy practices face increasing operational expenses (attachment C), including rent (e.g., reported rent increases of up to 32%), utilities, insurance, and compliance costs. These represent up to 50% of hourly revenue for RMTs.
    b. Administrative and compliance demands, particularly for NDIS-registered providers, further reduce effective margins. Many sole practitioners absorb these costs, leading to financial strain.
    c. AHPA's 2023-24 Submission to the NDIS Annual Pricing Review recommended pricing limits for all therapy services (including music therapy) should be raised to incorporate cumulative indexation in line with Wage Price Index and Consumer Price Index since 1 July 2019, or a one-off 10% increase to account for some of the costs increases experienced across allied health.
3. **Uncompensated Non-Face-to-Face Work**:
    a. Not all activities that result in a professional, high quality and safe service that delivers outcomes for participants are billable under NDIS rules. On average, RMTs report spending **47 minutes per hour** of direct support on unbilled non-face-to-face tasks, including administration, planning, documentation, communication (and advocacy support for participants) with NDIS staff, navigating changing NDIS requirements (e.g. PACE), travel beyond the travel caps, and collaboration with other treating practitioners, LACs and support coordinators. This uncompensated work is consistent with other allied health professions, including occupational therapy and speech pathology. This hidden workload underscores the necessity of maintaining current pricing to ensure fair compensation.
4. **Equitable Benchmarking Across Allied Health**:
    a. Music therapy aligns closely with other allied health professions (e.g., occupational therapy, speech pathology) in qualifications, clinical practice standards, and overhead

costs. Any reduction in pricing would disproportionately penalise RMTs and fail to reflect the complexity and value of their work.

5. **Impact on Market Sustainability**:
    a. Inconsistent pricing and administrative burdens have led 77% of RMTs to consider withdrawing from the NDIS market. Such attrition risks, if not mitigated, will result in market failure, reducing participant access to this essential therapy and undermining participant choice and control.
6. **Geographic and Participant-Specific Costs**:
    a. Music therapists often serve rural and remote communities, incurring travel-related costs not adequately accounted for in current pricing models. Additionally, they cater to diverse populations, including neurodivergent participants, requiring tailored resources and supports.

The Financial Reality of Music Therapy Service Provision

Type of Therapist	NSW / VIC / QLD / ACT	SA / WA / TAS / NT	Remote	Very Remote
Art Therapist, Audiologist, Developmental Educator, Dietitian, Music Therapist, Occupational Therapist, Orthoptist, Podiatrist, Rehabilitation Counsellor, Social Worker, Speech Pathologist, and Other Professional	$193.99	$193.99	$271.59	$290.99
Counsellor	$156.16	$156.16	$218.62	$234.24
Exercise Physiologist	$166.99	$166.99	$233.79	$250.49
Physiotherapist	$193.99	$224.62	$314.47	$336.93
Psychologist	$222.90	$244.22	$341.91	$366.33
Therapy Assistant - Level 1	$56.16	$56.16	$78.62	$84.24
Therapy Assistant - Level 2	$86.79	$86.79	$121.51	$130.19

Figure 3. Price limits for therapy services as at 1 July 2024 - (per hour)

Source: NDIS Pricing Arrangements and Price Limits 2024-25

The current NDIS pricing limit (see figure 3) for allied health services **is barely sustainable for sole trader Registered Music Therapists (RMTs) and is entirely inadequate for larger organisations**.

As outlined in the expense breakdown, an independent RMT delivering supports **at an hourly rate of $193.99** is not even **covering their essential business costs**. Even without the overheads of running a clinic—such as rent, administrative wages, and additional compliance costs—sole traders **have no margin for financial security or business growth**.

For **larger businesses employing multiple therapists**, the situation is even more precarious. **Unlike sole traders, companies must cover additional costs**, including:

- **Wages** for administrative staff, supervisors, and allied health assistants
- **Occupancy costs**, including rent, utilities, and maintenance
- **Compliance and accreditation expenses**, which are growing due to increased regulatory requirements

Despite these escalating costs, **the NDIS price limit has not increased in six years**. During this time, inflation, rising wages, insurance hikes, and operational expenses have placed **significant financial pressure on providers**. Many allied health businesses are now **only just breaking even**, forcing some to **reduce services, reject NDIS clients, or close entirely**.

Without an urgent **fee adjustment to reflect real-world costs**, there is a **significant risk to service availability**, particularly for those requiring complex, specialised, or ongoing therapy. The current pricing model is not sustainable, and **continued stagnation will further erode workforce retention, service accessibility, and overall participant outcomes**. AMTA strongly advocates for improving or at least retaining the current pricing limit for individualised music therapy sessions. Any reduction risks exacerbating provider attrition, limiting participant access, and undermining the sustainability of music therapy within the NDIS. The NDIA must ensure pricing reflects the true costs of service delivery, aligns with allied health benchmarks, and supports equitable access to high-quality therapeutic supports.

Support	Provider	Limit
Social and community participation (e.g. choir, music for leisure program)	Community musician, music teacher, music therapist (not registered with AMTA), Registered music therapist (registered with AMTA)	$67.56/hr
Individualised therapy support	Registered music therapist (registered with AMTA)	$193.99/hr (in-line with other allied health providers)
Group therapy support	Registered music therapist (registered with AMTA)	$193.99/hr (in-line with other allied health providers), divided between participants.

Figure 4. AMTA's minimum recommended price limits

Commitment to Fraud Prevention and Provider Competency

The Australian Music Therapy Association (AMTA) remains steadfast in its commitment to supporting the sustainability of the NDIS while reducing instances of fraud and non-compliance. We propose the following measures to ensure the highest standards of integrity and competency among Registered Music Therapists (RMTs):

1. **Strengthening Fraud Prevention**:
    a. AMTA recommends that all payments for music therapy services under the NDIS require the inclusion of an RMT's unique AMTA registration number on invoices. This streamlined verification process would above all else improve the quality and safety of the provision of music therapy which should only be delivered by an individual who has met the relevant qualification and registration criteria established and overseen by the AMTA. In addition, it will also enhance compliance monitoring, prevent fraudulent claims, and reinforce trust in music therapy providers.
2. **Exploring Specialist Credentialing Across Allied Health:**
    a. If the NDIA is interested in exploring a specialist credentialing framework across all allied health disciplines, AMTA would welcome discussion on how such a model could be applied within music therapy. This could include recognising advanced practice in areas such as neurodisability, complex communication needs, or trauma-informed care, offered in addition to masters-degree coursework.
    b. Such a framework would align music therapy with other allied health professions that offer credentialling pathways, reinforcing professional expertise while ensuring that all NDIS participants receive high-quality, specialised care. Any implementation would require careful consultation and an 18-month to 2-year rollout.
3. **Collaboration for Efficient Regulation:**
    a. As the peak not for profit body representing music therapy professionals across Australia, we believe AMTA is able to play a stronger role to ensure funding integrity and value for money for the taxpayer. Doing so would also consolidate registration processes, reduce administrative burdens for providers, and ensure alignment with both professional and NDIS standards.
    b. Against this backdrop, we propose to explore the establishment of a certification process in collaboration with the NDIA. RMTs wishing to obtain NDIS funding would need to obtain certification from AMTA to obtain government funding. RMTs would pay AMTA a modest fee for certification which, in turn, will enable our Association to develop additional professional development opportunities for the profession which, over time, will build additional integrity into the NDIS.
    c. From a policy perspective, it is arguable that all allied health professionals should be subject to similar regulation before a certification scheme like the one above is applied to music therapy professionals however, on balance, our members are willing to participate in this initiative.

4. **Addressing Broader Allied Health Challenges**:
    a. AMTA highlights that challenges related to fraud and title protection extend beyond music therapy to other allied health professions, such as speech pathology. These systemic issues require a unified response to safeguard participant outcomes across disciplines.

By reinforcing accountability, promoting professional excellence, and advocating for streamlined processes, AMTA is committed to ensuring that music therapy remains a trusted, effective, and sustainable support within the NDIS.

Risk of not engaging with a registered music therapist of AMTA

The Royal Commission into Violence, Abuse, Neglect and Exploitation of People with Disability (2019-2023) highlighted shortages of allied health professionals, and raised significant concerns about unqualified, unregulated workers delivering support outside their scope and the dangers this presents to people with disability. AMTA's registered music therapists are the only professionals in Australia who are qualified, regulated and certified to deliver music therapy.

There is sufficient evidence to warrant caution in the generalist application of music for people with therapeutic needs. Music that is applied without clinical assessment risks a range of harms to people with disability, their carers and families. Music-induced harms (Silverman et al., 2020) can include:

- physical or physiological harm, e.g. music-induced hearing loss, musicogenic seizures, arousal arrhythmias
- cognitive harm, e.g. impacting attention, dysregulation, ability to communicate
- affective harm (Bibb & McFerran, 2018), e.g. sensory or auditory distress, isolation, supporting rumination
- behavioural harm, e.g. risk-taking, promoting aggression, harmful music use as a coping strategy

Registered music therapists' competencies in assessment, observation, specialist music skills and therapeutic interventions allow the safe and supported goal-directed use of music to achieve therapeutic benefits and health, functional and wellbeing outcomes. Specialised clinical training, competencies and professional certification of registered music therapists, combined with consumer protections offered by the AMTA (regulatory frameworks, complaints mechanisms) effectively mitigate these potential harms.

Conclusion and next steps

Music therapy is an established and evidence-based allied health profession that plays a critical role in improving the functional capacity, health, and wellbeing of people with disability. The Australian Music Therapy Association (AMTA) has demonstrated through rigorous research, practice-based evidence, and real-world outcomes that music therapy contributes significantly to the functional goals outlined by the NDIS. The proposed reclassification of music therapy under 'Participation in Community, Social and Civic Activities' not only undermines the therapeutic integrity of the profession but also risks

limiting access to essential, goal-directed interventions for NDIS participants. Furthermore, the suggested pricing model fails to reflect the true costs of service provision, placing undue financial strain on providers and threatening the sustainability of music therapy as a viable NDIS support.

AMTA urges the NDIA to acknowledge the substantial body of evidence supporting music therapy as an allied health intervention and to maintain its inclusion under the current therapy support pricing structure. We remain committed to engaging constructively with the NDIA to ensure fair and appropriate funding arrangements that uphold participant choice and control while safeguarding the sustainability of the profession.

As the next steps, AMTA will:

1. **Continue Advocacy and Stakeholder Engagement** – Engage with government agencies, policymakers, and allied health peak bodies to reinforce the case for music therapy within the NDIS framework.
2. **Seek Transparency and Accountability** – Pursue access to the evidence base used by the NDIA in its initial decision and advocate for a fair, evidence-informed review process.
3. **Monitor and Respond to NDIA Actions** – Ensure a timely response to any proposed changes, including potential legal or regulatory avenues to challenge unfair policy shifts.
4. **Educate and Inform the Public** – Raise awareness among NDIS participants, families, and support coordinators about the importance of accessing registered music therapy services and the risks to the Scheme and participants of unregulated substitutes.

AMTA remains dedicated to ensuring that all NDIS participants who benefit from music therapy continue to have access to this vital service. We welcome further discussions with the NDIA to achieve an equitable and sustainable solution that recognises the unique and essential contributions of music therapy within the allied health sector.

For these reasons, and based on the evidence set out above, we believe the government's proposed changes to pricing for music therapy professionals in Australia should be rejected and price limits for therapy services as 1 July 2024 maintained.

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Attachment A

Recognition as allied health professionals

Commonwealth definition of allied health

Generally, the Australian Government recognises allied health professions that have all the below:

- a university qualification accredited by a relevant national accreditation body
- a national professional organisation with clearly defined membership criteria
- clear national entry-level competency standards and assessment processes
- autonomy of practice
- a clearly defined scope of practice.

Employment conditions and awards

Music Therapy Professionals are included in every state and territory's employment awards and/or enterprise agreements:

- ACT Public Sector Health Professional Enterprise Agreement 2023-2026
- Allied Health Professionals (Victorian Public Sector) (Single-Interest Employers) Enterprise Agreement 2021-2026
- Allied Health Professionals Public Sector Union Wages Agreement No. 2 of 2022
- Health Practitioners and Dental Officers (Queensland Health) Award - State 2015
- Health Professionals and Support Services Award 2020
- Health Professionals, Medical Scientists and Support Services (Victoria) State Reference Public Sector Modern Award 2018
- NSW Health Service Health Professionals (State) Award 2023
- South Australian Public Sector Enterprise Agreement: Salaried 2021
- WA Health System - HSUWA - Pacts Industrial Agreement 2022

Most state and territory governments include music therapy in their policies, position papers, and regulatory requirements for allied health professions:

- ACT Regulation of allied health
- NSW Health allied health professions
- QLD Allied health requirements to practice
- SA Allied and scientific health position statement
- TAS Allied health professional level 2 personal progression pathway statewide protocol
- Victoria Department of Health allied health professions

Inclusion in government funded services, policy and programs

Music Therapy Professionals are employed as allied health professionals in:

- acute care in specialist health networks (e.g. paediatric hospital networks) and local health districts and networks
- aged care
- child and family safety
- disability services
- education and child development
- First Nations health
- justice health
- mental health services
- PHN-commissioned services
- primary care
- academia
- workforce wellbeing.

Music Therapy Professionals are also included in a range of State and Commonwealth funded programs, in recognition of their role in achieving outcomes for patients, consumers, residents and people with lived experience of mental illness:

- Home Care Packages
- Commonwealth Home Support Programme
- Support at Home Clinical category - allied health and other therapeutic services (commences 1 July 2025)
- Revive National Cultural Policy music therapy pilot funded through Primary Health Networks
- Victorian Mental Health in Schools program
- Victorian Allied Health Mental Health Graduate Program

Additionally, Music Therapy Professionals are eligible for inclusion in:

- ACT allied health postgraduate scholarship scheme
- NSW Aboriginal Rural Allied Health University Student Scholarships
- NSW Rural Allied Health Clinical Placement Grants
- NSW Rural Allied Health Undergraduate/Entry Level Scholarships
- Other NSW Government funded professional development scholarships
- QLD Health Workforce Attraction Incentive Scheme
- Queensland Health Mental Health Scholarship Scheme
- SA Regional Local Health Network Scholarships
- Victorian Government Mental Health and Wellbeing Workforce Scholarship Program
- Centre for Mental Health Learning Statewide Allied Health Entry Level Training Series

Government-funded research grants

Years funded	Australian Government grant funding body and grant details	Amount funded
2024-2026	Australian Research Council *Revealing Universal and Cultural Origins of Music-Induced Affect.*	$914,548
2024-2026	Universities Australia *Solitary Silence & Social Sounds: Using music to alleviate feelings of loneliness in older adults*	$24,600
2024-2025	Australian Economic Accelerator (AE230100036), *Music Attuned Technology Care via eHealth (MATCH): A music adaptive technology and training program to manage dementia symptoms*	$207,000
2024-2025	Dementia Australia Research Foundation (Cat.3) *Building the Evidence for the Benefits of Music Programs in Aged Care*	$99,582
2023-2024	Aged Care Research Industry & Innovation Australia (ARIIA-GA00244) *A care-staff delivered music intervention to address patient and staff wellbeing within a Specialist Advanced Dementia unit*	$156,442
2022-2025	Australian Research Council *The Musical Escape: Investigating Music and Imagination*	$456,000
2022-2025	Australian Research Council (ACRG) *Music and speech as a window into the predictive brain [DECRA for Anna Fiveash]*	$409,781
2021-2026	MRFF - Dementia, Ageing & Aged Care Mission (#20007411) *Music Attuned Technology – Care via eHealth (MATCH)*	$1,998,866
2021-2026	Australian Research Council *To map and enhance Australian musical improvisation as a creative industry*	$262,130
2019-2025	Australian Research Council *Make the music speak for you: musicking with a deep net partner*	$335,250
2019-2024	Australian Research Council	$408,000

	Maintaining active minds and bodies through older adult music education	
2019-2023	NHMRC - Boosting Dementia Research (#1169867) *A HOME-based Spousal caregiver-delivered music Intervention for people living with Dementia (HOMESIDE)*	$707,600
2018-2022	NHMRC (#1144599) *Aphasia recovery with Music exPosure (AMP)*	$942,297
2017-2022	Australian Research Council *Uncovering universal mechanisms for the communication of musical emotion*	$369,000
2017-2021	NHMRC - Boosting Dementia Research Grant (#1137853) *Music Interventions for Depression and Dementia in Elderly (MIDDEL)*	$1,014,430
2016-2021	National Health and Medical Research Council Mood Regulation Using Music: A Community Health Strategy for Improving Quality of Life in People with Mild Dementia	$601,540
2016-2021	Australian Research Council *Developing a personalised Music Affect Recommender System*	$243,727
2016-2019	NHMRC-ARC - Dementia Research Fellowship (#1106603) *Remini-Sing: Therapeutic choirs for people living with dementia and their family caregivers*	$569,698
2016-2018	Australian Research Council *How musical rhythms entrain the human brain*	$373,536
2015-2019	Australian Research Council *Psychological and neurophysiological mechanisms underlying human interaction in musical contexts*	$866,250
2015-2017	ARC – Discovery Project (#150100201) *Singing my story: Negotiating identities through therapeutic songwriting for people with neurological injuries*	$371,940
2015-2018	ARC Linkage Project (LP150100697) *Building resilient school communities through tailored arts programs*	

2014-2018	ARC Discovery Project (DP140102679) *Musical investment: assessing and enabling musical participation for wellbeing impact across the lifespan*	$261,000
2011-2015	ARC Future Fellowship (FT100100022) *What's in the music? A lifespan model of emotional and musical creativity in therapeutic songwriting*	$621,426
2011-2015	ARC Discovery Project (DP110102483) *The use of music as bridge between strengths and difficulties in order to prevent mental ill-health through early identification and early intervention in adolescence*	$504,000
2008-2011	ARC - Discovery Project (DP0878494) *Songs for Life: Group music therapy for severe mental illness*	$238,000
2008-2010	Victorian Neurotrauma Initiative (VNI-D066) *Singing in Spinal: Therapeutic singing for respiratory function, voice, and mood following quadriplegia*	$307,129
2006-2008	ARC DECRA (DP0666735) *Fostering a healthy adolescence through musical participation*	$68,532
	Total	$13,332,304

Attachment B

Service Delivery Insights

On 25 January 2025, RMTs working within the NDIS were surveyed to gain insight into their service delivery models to further inform the independent pricing review. At 1 July 2024, Australian Music Therapy Association (AMTA) registration records indicated that 594 (out of 950 members) registered music therapists (RMTs) provide therapy supports to participants of the National Disability Insurance Scheme (NDIS), in some capacity. Of these, 206 (35%) completed the survey. A summary of the results follows.

Working arrangements of registered music therapists

62%

Sole-trader and working alone

9%

Directors of companies that employ music therapists

20%

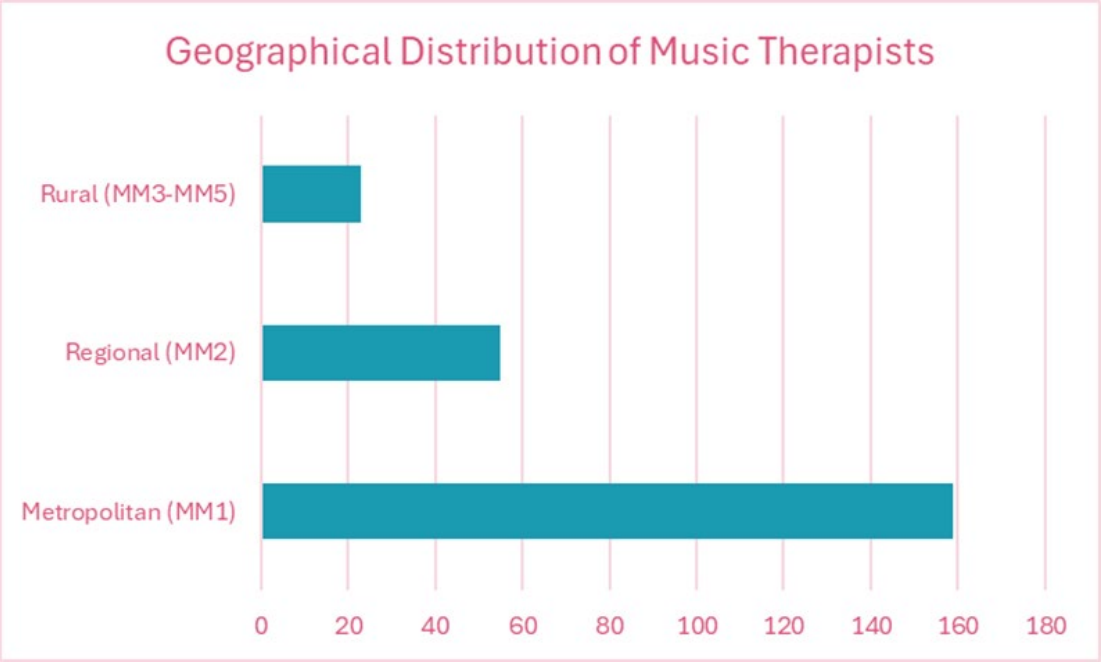
Lease premises

61%

Provide mobile services

0.5FTE

Average FTE of sole-trader RMTs, working alone



65%

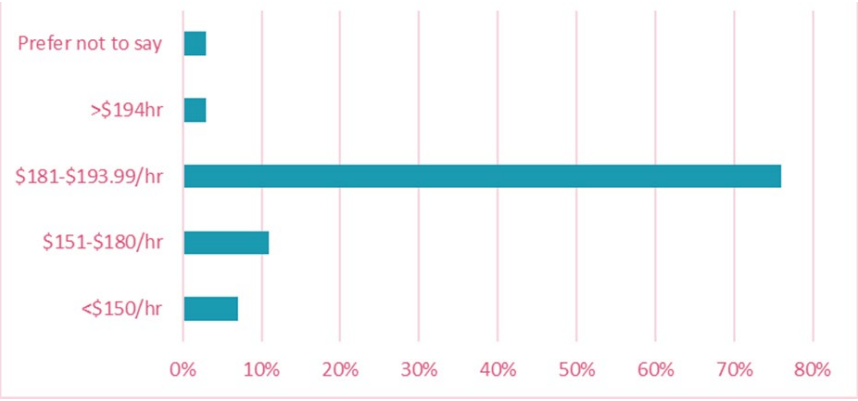
No administrative support and complete all administrative tasks themselves

13%

Employ non-revenue producing, administrative support as follows:

Mean= 1FTE **Median = 0.5FTE** **Mode = 0.2FTE**

Private billing rate of sole-trader RMTs and companies



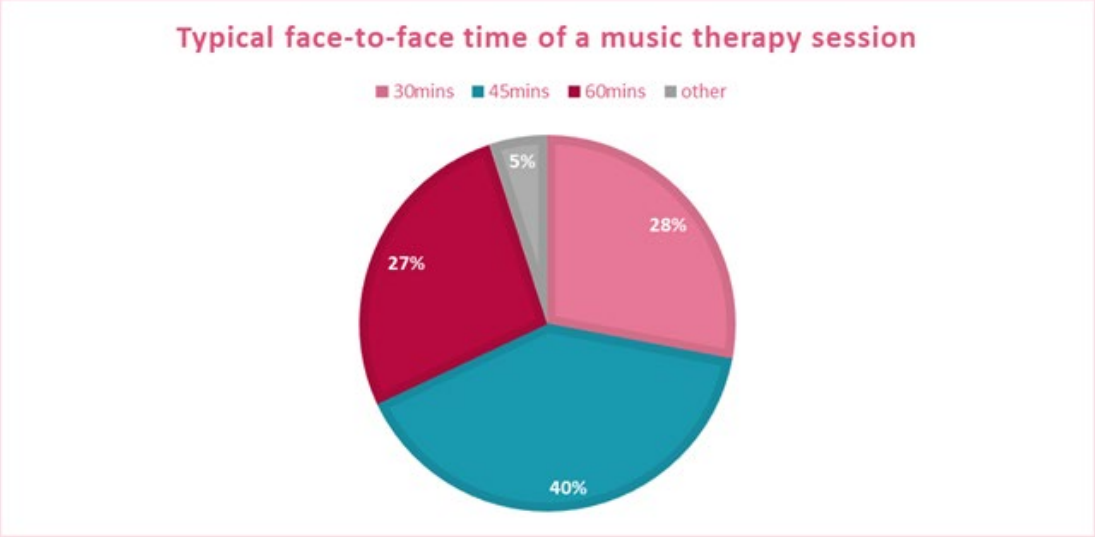
Service delivery data

From 206 respondents, the survey collected data on the delivery of:

65,314 sessions.

36%

Sessions provided in the home, school, kindy or other community location.



80%

Charge for some form of non-face-to-face time supports.

20%

Do not charge for non-face-to-face time supports

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13 minutes

- The average non-face-to-face time billed by RMTs (per session, this excludes billing for reports required by the NDIA for the purpose of a NDIS review)

Attachment C

Detailed cost breakdown

According to SEEK, the average salary range for health professionals in Australia is currently $110,000–$130,000 per annum (SEEK, 2025). The **Health Professionals and Support Services Award MA000027** stipulates that a **Registered Music Therapist (RMT) with seven years of experience** is entitled to a minimum annual full-time salary of **$**80,166.32. The ongoing **workforce shortage, largely driven by the NDIS**, has significantly increased salaries for health professionals across Australia. To provide a fair cost representation for a **self-employed, sole-trader RMT**, this analysis takes the average of the award rate and the lower end of SEEK's salary range ($110,000), resulting in an annual income estimate of **$95,083.16**.

Data from the **Service Delivery Insights survey** indicates that on average sole-trader RMTs generate approximately **$**730.00 of revenue per day, creating a shortfall to meet expenses of over $6000 per year.

The following analysis provides a breakdown of the costs that a sole-trader's revenue must cover on an annual basis. This assumes the provider is **fully mobile, with no fixed premises** which aligns with the **majority of RMTs**, as reported in the same survey. Note this is an averaged example only. AMTA endorses AHPA's recommendation for the NDIA to develop a specific bottom-up Cost Model to estimate the true cost of allied health service provision under the NDIS.

Expense	$ Value per year	Percentage of revenue
Practice Management Software	$300.00	0.18%
Subscriptions	$400.00	0.24%
Insurance (PL & PII)	$500.00	0.30%
Bookkeeping	$600.00	0.36%
Professional Fees (AMTA Reg)	$600.00	0.36%
Printing/stationery	$1,000.00	0.61%
Accounting	$1,000.00	0.61%
Networking/Meeting/Marketing Costs	$1,000.00	0.61%
Travel allowance	$2,000.00	1.21%
Website	$2,000.00	1.21%
Resources	$2,000.00	1.21%
NDIS Registration/Audit	$3,000.00	1.82%

Equipment	$3,000.00	1.82%
Professional development	$4,000.00	2.43%
Supervision	$4,800.00	2.91%
Insurance (TPD & Income Protection)	$5,000.00	3.04%
Superannuation	$10,459.00	6.35%
Admin support	$13,000.00	7.89%
GST	$14,974.00	9.09%
Salary	$95,083.16	57.73%
Total	**$164,716.16**	

Appendix 1: AMTA Practice Evidence Summary

NDIS Reports

Aim

The purpose of this report is to provide an overview of the types of clinical evidence that are reported by Registered Music Therapists via Plan Review Reports for the NDIS. Through analysing a sample of reports that have previously been submitted to NDIS, we aim to:

provide an overview of key features of music therapy and music therapy approaches for people with disability as stated in the collected reports (i.e. music therapy participants, goals and objectives, methods and assessment)

provide evidence of benefit of music therapy in improving disability-related functional capacity for NDIS participants as stated in the collected reports (i.e. music therapy goals and outcomes, case examples)

identify any barriers to goal attainment as reported by Registered Music Therapists

Background

Key Terminology

In this report, we will reference key terms that are utilised commonly in the NDIS space. These include:

Participants: a person with a disability who accesses the NDIS

Registered Music Therapists (RMTs): a person who is qualified via a tertiary degree and registered with the Australian Music Therapy Association (AMTA)

Plan: the funding package that a participant receives from the NDIS

Plan Period: the dates during which a participant is able to utilise their funding

NDIS Reporting

Registered Music Therapists (RMTs) working with NDIS participants are required to provide a written report summarising progress towards goals; this report is submitted to the NDIS, often via an intermediary (e.g. a Support Coordinator, Local Area Coordinator, or the participant themselves). Typically, reports are required at the end of each plan period, however, in recent years, some reporting periods have been extended due to 'plan roll-overs', where a review of funding is delayed.

There are currently no mandatory standards for Allied Health reporting, however, NDIA provide a guide that outlines what is required here. Therapists from all Allied Health disciplines, including RMTs, may therefore vary their reporting styles depending on a range of factors including clinical population, place of employment, and discipline.

Understanding functional capacity

To be eligible to access the NDIS, participants must have a permanent impairment that substantially reduces their functional capacity or ability to undertake activities in one of the following areas: communicating, socialising, learning, mobility or moving around, self-care, or self-management (NDIS, 2024). These are referred to by the NDIS as 'functional domains', 'life skill areas', 'life domains' or 'activity'. For the purpose of this document, we will be referring to 'functional domains' using the terms provided in the terms of reference with the descriptions below. These descriptions are based on information available on the NDIS website and relevant documents and fact sheets (see reference list), as well as our clinical judgement.

- ***Language and communication:*** *Communicating – How you speak, write, or use sign language and gestures, to express yourself compared to other people your age. How well you understand people, and how others understand you.*
- ***Personal care:*** *Self-care – personal care, hygiene, grooming, eating and drinking, and health. How you get dressed, shower or bathe, eat or go to the toilet.*
- ***Mobility and movement:*** *Mobility or moving around – How easily you move around your home and community, and how you get in and out of bed or a chair. How you get out and about and use your arms or legs.*
- ***Interpersonal interactions:*** *Socialising – How you make and keep friends, or interact with the community, or how a young child plays with other children. We also look at your behaviour, and how you cope with feelings and emotions in social situations. For example, people experiencing psychosocial disability may experience social avoidance and difficulty accessing the community.*
- ***Functioning (including psychosocial functioning):*** *Learning – how you learn, understand and remember new things, and practise and use new skills. Self-management – how you organise your life. How you plan, make decisions, and look after yourself. This might include day-to-day tasks at home, how you solve problems, or manage your money. We consider your functional ability/mental or cognitive ability to manage your life, not your physical ability to do these tasks.*
- ***Community living:*** *your capacity to live independently in the community. This includes your living skills, money and household management, social and communication skills and behaviour, as well as home modifications.*

Method

Eligibility Criteria

Reports collected were prepared by RMTs registered with the Australian Music Therapy Association and working with NDIS participants. The reports collected must have been submitted previously to the NDIS for a participant's plan review.

Data Collection

We collated a sample of 50 NDIS reports from Registered Music Therapists (RMTs) working in a diverse range of contexts within the NDIS. This included RMTs working as sole traders, for music therapy small businesses, or as part of larger disability providers. RMTs were approached purposively; a shortlist of RMTs working in diverse settings around the country was created, and these RMTs were approached by

members of the team. Once this initial list was exhausted, a second round of RMTs from diverse practice areas were approached. RMTs sought written consent from their NDIS participants prior to sharing a de-identified copy of their report.

Data Analysis

We extracted data relating to demographic information (age, diagnosis), goals (music therapy goals and objectives) and intervention (methods and dosage) to contextualise the practice. A deductive content analysis was then undertaken to identify key goal areas, outcome areas, level of impact, and barriers to achieving goals.

Results

Participant demographics

From the 50 reports, 45 reported demographic characteristics (age, disability/diagnoses) [Table 1]. Half of the music therapy participants in the collected reports were adults (over 18 years old), and half were school-aged (7-17 years) or early intervention (0-6 years). Participants had a range of diagnoses and conditions resulting in permanent impairment across intellectual, cognitive, neurological, physical, sensory, and psychosocial domains. In total, 96 diagnoses were recorded for the 45 participants (range 1-6 diagnoses per person). Over half of all music therapy participants (58%) had two or more diagnoses and over a third (36%) had three or more diagnoses. Several had complex conditions resulting in multiple types of impairments.

Table 1. Demographic characteristics of music therapy participants in included reports

Characteristics	MT participants (N=45)	
	n	%
Age		
...Early intervention (0-6 years)	8	18%
...School-aged (7-17 years)	14	31%
...Adult (≥18 years)	23	51%
Number of diagnoses		
...One diagnosis	19	42%
...Two diagnoses	10	22%
...Three or more diagnoses	16	36%
Primary diagnoses		
...Acquired brain injury	1	2%
...Autism	19	42%
...Cerebral palsy	3	7%
...Childhood DIPG brain tumour	1	2%
...Down syndrome/Trisomy 21	2	4%

...(Global) developmental delay	4	9%
...Intellectual disability	12	27%
...Neurodegenerative conditions	4	9%
...Psychosocial disability	9	20%
...Rare genetic conditions	8	18%
Additional diagnoses		
...ADHD	4	9%
...Anxiety	4	9%
...Auditory processing deficiency	1	2%
...Communication disorders	6	13%
...Depression	3	7%
...Epilepsy	5	11%
…Fibromyalgia	1	2%
...Hearing impairment/loss	1	2%
...OCD	1	2%
...PTSD	4	9%
...Vision impairment/loss	3	7%

Note: Age and number of diagnoses are based on number of participants; types of primary and secondary diagnoses are based on number of instances of this diagnosis across participants.

ADHD, Attention Deficit Hyperactivity Disorder; OCD, Obsessive-Compulsive Disorder; PTSD, Post-Traumatic Stress Disorder. **Neurodegenerative conditions** included multiple sclerosis, Huntington's disease, posterior cortical atrophy and young-onset dementia. **Rare genetic conditions** included genetic disorders causing multiple impairments, such as Bosch Boonstra Schaaf optic atrophy syndrome, Angelman syndrome, Coffin-Siris syndrome, pachygyria, tuberous sclerosis and rare chromosomal duplication. **Psychosocial disability** included diagnoses of schizoaffective disorder, paranoid schizophrenia, bipolar disorder, borderline personality disorder and antisocial personality disorder.

Music therapy in the NDIS

Music therapy helps participants improve their functional capacity in areas such as language and communication, interpersonal interactions, functioning (including psychosocial functioning), and mobility and movement.

Drawing on the affordances of music, Registered Music Therapists (RMTs) design tailored evidence-based experiences (interventions) that improve participants' functional skills. These skills transfer to participants' life and affect their everyday functioning.

Goals and objectives

We analysed music therapy participants' stated goals and mapped these to the functional domains outlined in the terms of reference for this review (based on the descriptions provided above). All reports (n=50) were included in analysis of music therapy goals and objectives.

Increasing functional capacity

Music therapy goals noted in the included reports primarily aimed to increase functional capacity in the areas of:

- **language and communication** (e.g. expressive and receptive language, speech clarity and volume, choice-making and self-expression through both verbal and non-verbal communication methods)
- **functioning (cognitive)** (e.g. executive functioning or cognitive abilities and mental processes related to attention and concentration, memory, decision-making, planning, problem solving and task completion)
- **functioning (psychosocial)** (e.g. behaviour management or support, regulation of feelings and emotions, independence, motivation, self-confidence, self-concept and sense of identity, participation in social, community and education contexts)
- **interpersonal interactions** (e.g. social skills, emotional/behavioural regulation, social interactions, building relationships and accessing the community)
- **mobility and movement** (e.g. fine and gross motor skills, strength and range of movement)

Addressing multiple goals simultaneously

All reports indicated that RMTs addressed multiple goals simultaneously. The majority of participants' MT goals addressed at least two different functional domains (median = 2; mean = 2.3; range = 1-4).

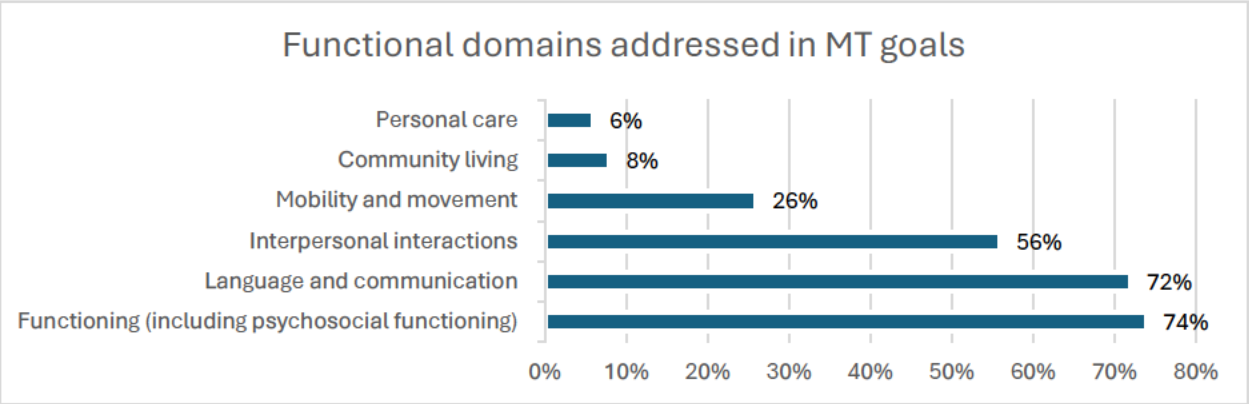


Figure 1. Percentage of music therapy (MT) participants with stated goals addressing different functional domains

Table 2. Functional domains addressed in participants' music therapy goals

Functional domains	MT Participants (N=50)	
	n	%
Functioning (including psychosocial functioning)	37	74%
Language and communication	36	72%
Interpersonal interactions	28	56%
Mobility and movement	13	26%

Community living	4	8%
Personal care	3	6%

Table 3. Overview of functional domains addressed in MT goals stated in NDIS reports

Functional domain	MT goal area	Example goals/objectives
Language and communication: How you speak, write, or use sign language and gestures, to express yourself compared to other people your age. How well you understand people, and how others understand you.	Expressive language	• Increase spontaneous speech output • Production of words/phrases • Imitation/repetition of phrases and sounds • Functional vocabulary • Learning/using non-verbal communication (e.g. AAC, keyword sign, gestures)
	Receptive language	• Improve ability to follow instructions • Improve ability to respond to questions • Improve listening skills • Improve joint attention
	Speech clarity and volume	• Improve speech articulation • Clarity of vowels and consonants • Frequency of phonics • Stutter management • Increase vocal volume and breath support • Increase vocal endurance • Intonation • Improve oral motor control
	Self-expression	• Communicating needs, preferences • Making choices/requests • Expanding range of communication • Non-verbal communication (e.g. AAC, keyword sign, gestures, choice board, switch program)
Interpersonal interactions: How you make and keep friends, or interact with the community, or how a young child plays with other children. Your behaviour, and how you cope with feelings and emotions in social situations.	Social skills	• Turn-taking • Matching/responding, following/initiating • Extending joint attention • Social play with peers • Socially appropriate behaviours • Social independence & confidence
	Emotional regulation	• Support levels of co-regulation • Support self-regulation • Skills and strategies to manage emotions in social situations (e.g. calming strategies, understanding emotions, communication/sharing)
	Social interactions/ relationships	• Participation • Collaboration • Healthy relationships • Meaningful social interactions • Accessing the community

Functioning (including psychosocial functioning): How you learn, understand and remember new things, and practise and use new skills. How you organise your life; how you plan, make decisions, and look after yourself. This might include day-to-day tasks at home, how you solve problems, or manage your money. We consider your mental or cognitive ability to manage your life, not your physical ability to do these tasks.	Executive functioning	• Following multi-step instructions • Sustained and focused attention • Increasing concentration span • Decision-making, problem solving • Task completion, dual tasking • Learning • Working memory, retaining information • Auditory processing • Capacity to navigate complex cognitive tasks and demands • Attainment of age-appropriate milestones • Participation at school/in academic and vocational pursuits
	Psychosocial functioning	• Emotional stability and regulation (e.g. identify, express and regulate feelings and emotions) • Music-based strategies for self-management of anxiety, mood, reducing distress • Arousal regulation • Behaviour regulation (e.g. reduce head-hitting behaviour) • Strategies to assist in managing complex behaviours in daily life • Independence, self-confidence (trying new things, choice-making) • Self-regulation in social, community and education environments • Participation at school/in academic and vocational pursuits
Mobility and movement: How easily you move around your home and community, and how you get in and out of bed or a chair. How you get out and about and use your arms or legs.	Fine motor skills	• Improve pincer grasp • Increase finger dexterity and strength • Increase frequency of bilateral hand movements • Strengthen hand muscles • Sustain hand use for functional movement tasks • Improve manipulation of instruments
	Gross motor skills	• Increase balance • Improve gait confidence • Improve coordination • Improve posture
	Range of movement	• Increase arm reach • Improve muscle strength

MT methods and techniques

The below table provides an overview of the range of MT methods that were reported, and a brief explanation of what these entail, compared to recreational music.

Table 4. Examples of Reported Methods

Method	Description	Related Goal Area/ Functional Domain
Rhythmic Speech Cueing (RSC)	The use of rhythmic cuing to control the initiation and rate of speech through cuing and pacing. The therapist may use the client's hand, a drum, or a metronome to prime speech patterns or pace the rate of speech. This technique can be useful to facilitate motor planning for a patient with apraxia, to cue muscular coordination for dysarthria, or assist in pacing with fluency disorders (Thaut, 2005).	Language and communication
Vocal Intonation Therapy (VIT)	The use of intoned phrases simulating the prosody, inflection, and pacing of normal speech. This is done through vocal exercises which train all aspects of voice control including: inflection, pitch, breath control, timbre, and dynamics. An example would be to sing a 5-note scale and gradually move the starting pitch up or down by half steps with a child who has a limited pitch range in their normal speaking voice. This exercise could be further expanded by adding a functional sentence (e.g. "Let's go out and play" (Thaut, 2005).	Language and communication
Melodic Intonation Therapy (MIT)	A treatment technique developed for expressive aphasia rehabilitation which utilizes a patient's unimpaired ability to sing, to facilitate spontaneous and voluntary speech through sung and chanted melodies which resemble natural speech intonation patterns (Sparks et al., 1974). When using MIT with aphasia, the emphasis is to increase the linguistic or semantic aspects of verbal utterances (Thaut, 2005).	Language and communication
Oral Motor and Respiratory Exercises (OMREX)	Is a Neurologic Music Therapy technique that involves the use of musical materials and exercises, mainly through sound vocalization and wind instrument playing, to enhance articulatory control and respiratory strength and function of the speech apparatus. This technique would be used with such populations as developmental disorders, dysarthria, and muscular dystrophy (Hass & Distenfield, 1986).	Language and communication
Rhythm and Movement for Self-Regulation (RAMSR)	A program for young children that aims to support their attentional and emotional regulation skills, as well as mental flexibility, inhibition, and working memory (the executive functions). RAMSR is a series of rhythmic movement activities that encourage beat synchronization and challenge one or more of the executive functions in a fun and engaging way. Activities are supported by rhythmic auditory cueing and include start/stop (inhibition) games, reversal of instruction games (shifting), and working memory games. Sessions end with a calming series of movements to target emotional regulation. Extensions of activities are provided to allow for increasing levels of challenge (Williams, 2018).	Functioning, Interpersonal interactions

Musical Attention Control Training (MACT)	Musical Attention Control Training is a Neurologic Music Therapy technique in which musical activities are tailored to clients' interests and designed to exercise elements of attention (such as sustained attention, set shifting) etc.	Functioning (Cognitive)
Improvisation	Clinical improvisation is the use of musical improvisation in an environment of trust and support established to meet the needs of clients (Wigram, 2004). Improvisation, using of instruments, voice, or other media, is often utilised based on the principles of communicative musicality (Malloch & Trevarthen, 2009), in which musical elements of communications are viewed as the building blocks of human interaction. Through improvisation, musical interactions are used to develop reciprocity between therapist and client. Improvisations also afford clients an opportunity to experience and practice non-musical functioning and behaviours (Roth, 2014).	Interpersonal interactions, Language and communication
Therapeutic Songwriting	Therapeutic songwriting is the process of creating, notating and/or recording lyrics and music by a client or group of clients and therapist within a therapeutic relationship to address psychosocial, emotional, cognitive and communication needs of the client or clients (Baker, 2015). Songwriting can be used to support emotional expression, build language skills, and assist with personal care tasks (strategic song writing).	Functioning, Language and communication, Interpersonal interactions Personal Care
Instrumental Play	Instrumental play can be used in a range of forms for a range of purposes. Some examples include: - playing handheld percussion for gross motor skills/mobility - learning piano techniques for fine motor skills - exercises on wind instruments to increase lung capacity	Mobility and movement Interpersonal Interactions Functioning (Cognition)
Therapeutic singing	A technique which involves the use of singing activities to facilitate initiation, development, and articulation in speech and language as well as to increase functions of the respiratory apparatus. Therapeutic singing can be used with a variety of neurological or developmental speech and language dysfunctions (Glover et al., 1996; Jackson et al., 1997; Thaut, 2005).	Language and communication
Music / Lyric Analysis	Music therapists may use live or pre-recorded music as the basis for verbal counselling to encourage clients to explore their feelings and discuss opinions. For example,	Interpersonal Interactions Language and Communication Functioning (psychosocial)
Receptive Music Therapy	Receptive music therapy approaches (listening to live or pre-recorded music) can be used to achieve a range of outcomes: - music for relaxation - music for mood regulation (including playlist creation and evaluation) - music and imagery to process complex emotions (Grocke & Wigram, 2007)	Interpersonal reactions Functioning (psychosocial)

Assessment and Evaluation

In the context of NDIS, RMTs use a range of measures to assess and evaluate music progress in music therapy. Depending on the setting and clinical population, these may be based on a combination of clinical observations, therapist-derived measures, formal music therapy outcome measures, and standardised, diagnosis-specific outcome measures.

"Music therapy assessment can be defined as a structured process of 1) preparation; 2) data gathering; 3) analysis, interpretation and elaboration of conclusions about the assessed data; as well as 4) documentation and communication of musical and non- musical data about the music therapy process in order to provide information to take decisions, raise hypotheses, to know more about the client and seek a better understanding of the music therapy process." **(Gattino, 2021).**

Evaluation Methods

The following table outlines the *types* of evaluation methods used by RMTs across the sample reports (n=50), and the number of reports that utilise them. All reports included clinical observation/assessment, and most reports used at least two types of assessment.

Table 5. Examples of Outcome Measures Utilised in Reports

Type of Assessment	Number of reports	Description
Clinical assessments (music therapy)		
Clinical observation/ assessment (qualitative)	All reports	Data collected by clinician observation including achievement of tasks/goals, engagement with music interventions, behaviour change, changes in verbal/non-verbal communication, social engagement, etc.
Collaborative assessment	22	Assessment of progress in collaboration with participant and/or guardians. Includes quotes and/or perspectives from participants/guardians.
Quantitative assessment	11	Progressive quantitative data collected by clinician including frequency/speed/time of task achievement, voice volume, Likert scales etc.
Validated assessments (music therapy)		
IMCAP-ND *(Carpente, 2013)*	2	A validated and reliable measure designed for measuring the impact of music therapy on a range of outcomes in autistic children.
Healthy & Unhealthy Uses of Music Scale *(Hense et al., 2018)*.	1	A validated test to measure the healthy-unhealthy dimension of participants' music-use in relation to mental health.

Standardised measures		
Overt Behaviour Scale *(Kelly et al., 2019)*	5	A standardised and validated caregiver-completed questionnaire regarding impact and frequency of inappropriate, offensive, or dangerous behaviours. Such behaviours can be a helpful indicator towards identifying underlying neuro-motor challenges, sensory difficulties or the ongoing impacts of trauma.
Screen for Child Anxiety Related Disorders (SCARED) Parent Version	4	A standardised and validated caregiver-completed questionnaire designed to screen for the presence of various anxiety disorders.
Barthel Index of Activities of Daily Living *(Liu et al., 2015)*	3	A standardised and validated caregiver-completed questionnaire regarding client's level of independence performing selfcare tasks. Independence in self-care tasks can be a helpful indicator towards identifying neuromotor challenges.
Mississippi Aphasia Screening Test *(Nakase-Thompson et al., 2005)*	3	A standardised and validated therapist-administered test to ascertain the possible presence of expressive and receptive aphasia in a client.
Combined Retained Primitive Reflexes Assessment *(Chandradasa & Rathnayake, 2024)*	3	Therapist-administered observational tests to assess how many infant reflexes a client has retained.
Digit Span Test *(Jahanshahi et al., 2008)*	2	A standardised therapist-administered test to assess client's working memory capacity.
Patient Health Questionnaire-9 (PHQ-9) *(Manea et al., 2015)*	1	A standardised self-administered test to screen for and assess depression severity.
Social Responsiveness Scale, 2nd Edition (SRS-2) *(Bruni, 2014)*	1	A standardised and validated scale for detection of the presence and severity of social deficits in the autism spectrum.
Other		
Talkabout Assessment of Social Skills	3	A therapist-administered software tool for the assessment of social skills.
Trail making tests	3	A therapist-administered test used to assess sustained attention (part A and B) and the use of working memory (part B).
Combined Retained Primitive Reflexes Assessment (*Chandradasa & Rathnayake, 2024)*	3	Therapist-administered observational tests to assess how many infant reflexes a client has retained.
Impacts of Paediatric Neurodivergence On Sleep Scale (IPNOSS)	3	A caregiver-completed questionnaire assessing the quality and level of independence of a child's sleep.
Mini-Cog *(Borson et al., 2003)*	3	A short therapist-administered test to briefly assess client's executive function

		and short-term memory capacity. While this test is typically used to detect dementia, in this context it was used to establish trends in conjunction with other measures.
Speech Intelligibility Test	3	A therapist-administered test used to assess what percentage of the client's verbal language can be understood by an unfamiliar verbal partner, and in doing so screen for the possible presence of dysarthria or apraxia of speech.
AAC Device Utilisation Checklist	1	A therapist-administered log of participant's use adapted AAC devices during music therapy
Paediatric Motor Assessment (PMA)	1	A therapist-administered assessment of fine and gross motor skills
Task Engagement and Completion Index (TECI)	1	A therapist-administered assessment and log of task engagement and completion
Self-Regulation Scale (SRS)	1	A therapist-administered assessment; rating and tracking participant's ability to apply learned regulation strategies.
Cadence Assessment	1	A therapist-administered set of observations to establish a person's functional cadence

Outcomes

Across the 50 reports analysed, a total of 363 outcomes of music therapy interventions were reported. Due to the heterogeneity of reporting styles, it was not possible to quantify a success rate or estimate effect sizes. Thematic analysis revealed that across all reports, goals were typically met or partially met, but with further therapeutic intervention recommended due to the complex and ongoing nature of participants' disabilities. Figure 2 depicts the spread of reported outcomes across the NDIA's Functional Domains. Table 6 summarises the instances of specific outcome areas and provides illustrative examples from the reports for each. The qualitative data also points to the significant role of motivation in participant engagement. Participant motivation to engage in MT supported them to continue working on their functional goals. This was recognised and reported on by participants, parents and RMTs.

Barriers to complete goal attainment were also reported, and are summarised below in Table 7.

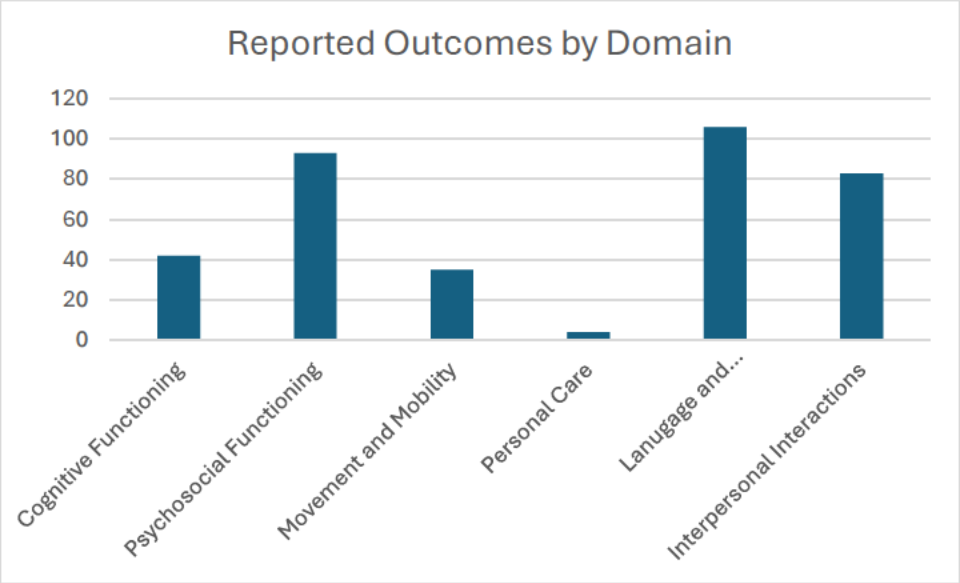
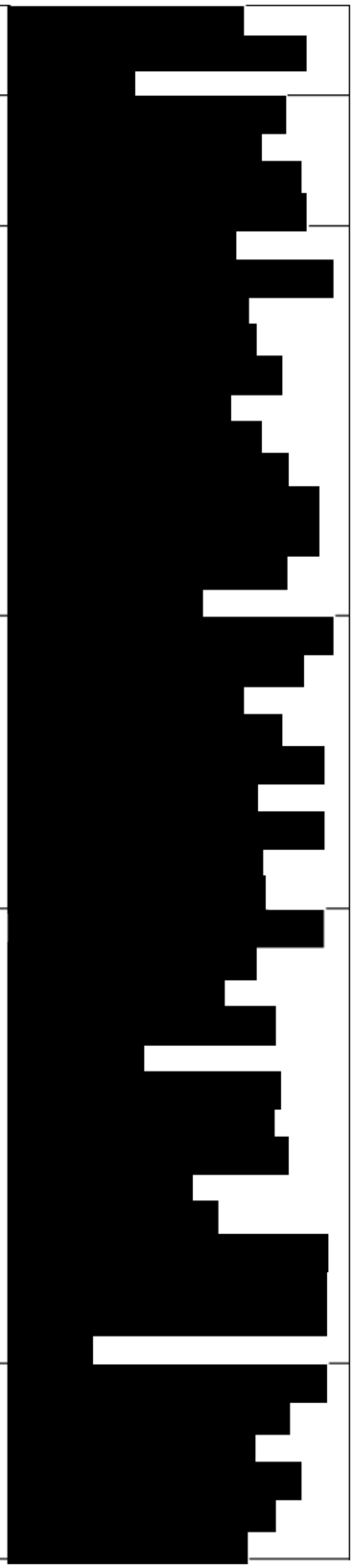


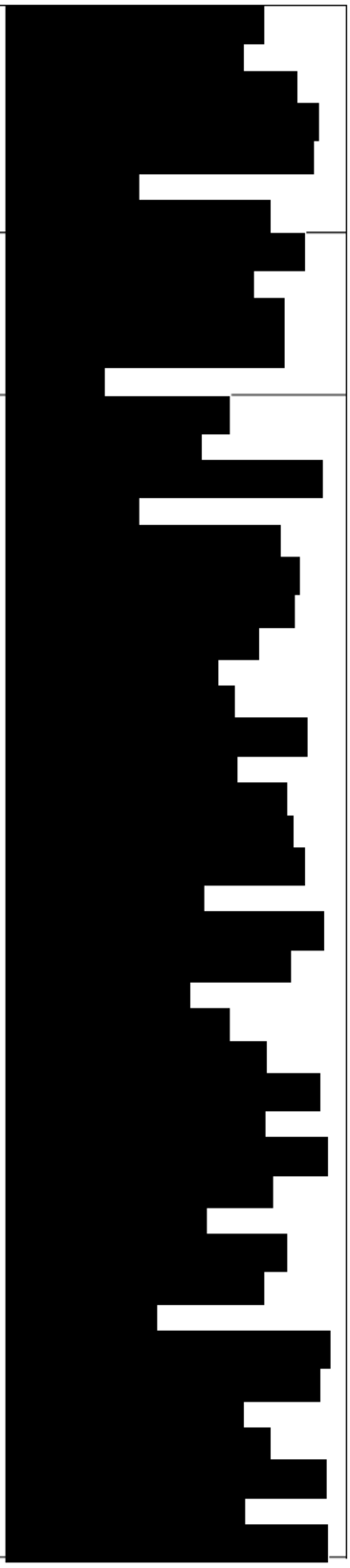
Figure 2. Frequency of Outcomes by Domain

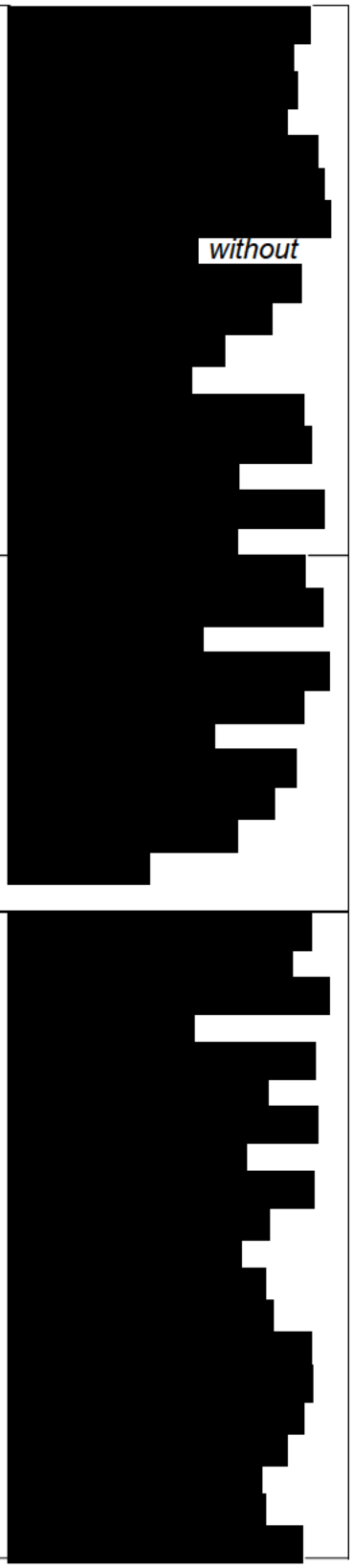
Table 6. Reported Outcomes by Domain, Area and Example

Functional Domain	Outcome Area		Example
Language and Communication	**Improved Expressive Communication**	Improved Ability to Make Choices (6)	[redacted]
		Improved Intelligibility (9)	

			
		Improved use of AAC (13)	
		Increased Verbal Output (21)	
		Increased Vocabulary (4)	
		Increased Vocal Expression (8)	
		Improved Emotional Expression (18)	

	Non-Verbal Communication	Increased Joint Attention (5)	
		Increased Reciprocity (9)	



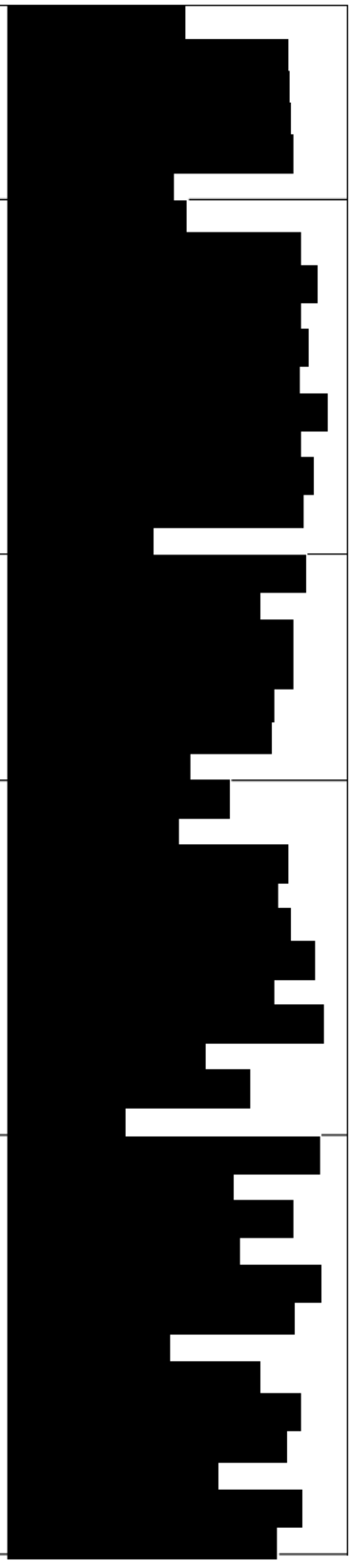
			
	Improved Vocal Ability	Increased Voice Volume (2)	
		Improved Breath Support (1)	

			[redacted]
		Increased Voice Endurance (2)	
	Improved Receptive Language Skills	Improved Receptive Understanding (8)	
Interpersonal Interactions	**Intrapersonal Capacity**	Improved Behaviour (8)	
		Improved Regulation of Mood/Behaviour (34)	

			[redacted]
		Developed Skills to Self-Regulate (5)	
		Improved Emotional Literacy (7)	
	Interpersonal Capacity	Improved Social Skills (29)	
Functioning	**Cognitive Functioning**	Improved General Executive Function (2)	
		Set Shifting (3)	

			al cues
		Dual Tasking (3)	
		Attention/Concentration (22)	
		Working Memory (6)	
		Problem Solving (3)	

			
		Improved Visual Perception (1)	
		Improved Cognition for Activities Outside of MT (2)	
	Psychosocial Functioning	Increased Self-Confidence (15)	
		Increased Ability to Engage in Therapy (19)	

		Increased Ability to Engage in Community (13)	
		Reduce Social Isolation (8)	
		Reduced Anxiety (12)	
		Improved Mood (8)	
		Increased Self Efficacy (10)	

			[redacted]
		Prevent Functional Decline (2)	
		Increased Ability of Care Team to Support (6)	
	Life skills	4	

			[redacted]

As described above, while several goals were marked as achieved, every report contained at least one goal that was only partially achieved. This was typically expected, due to the complex nature of the impairment (and related diagnoses), and environment around the participant. In most cases, RMTs reported that these complexities result in slower-than-desired progress towards goal attainment. Table 7 shows key barriers identified in the reports, and provides an example of each.

Table 7. Barriers to Goal Attainment

Barrier	Frequency	Example
Complexity of disability/functional Impairment (requires more time/support)	30	[redacted]
Progressive Disability (functional impairment requires maintenance)	4	
External factors (impeded progress)	8	
Limited funding	1	
Participant declined to continue on this goal	2	

Case example 1 (R.3)

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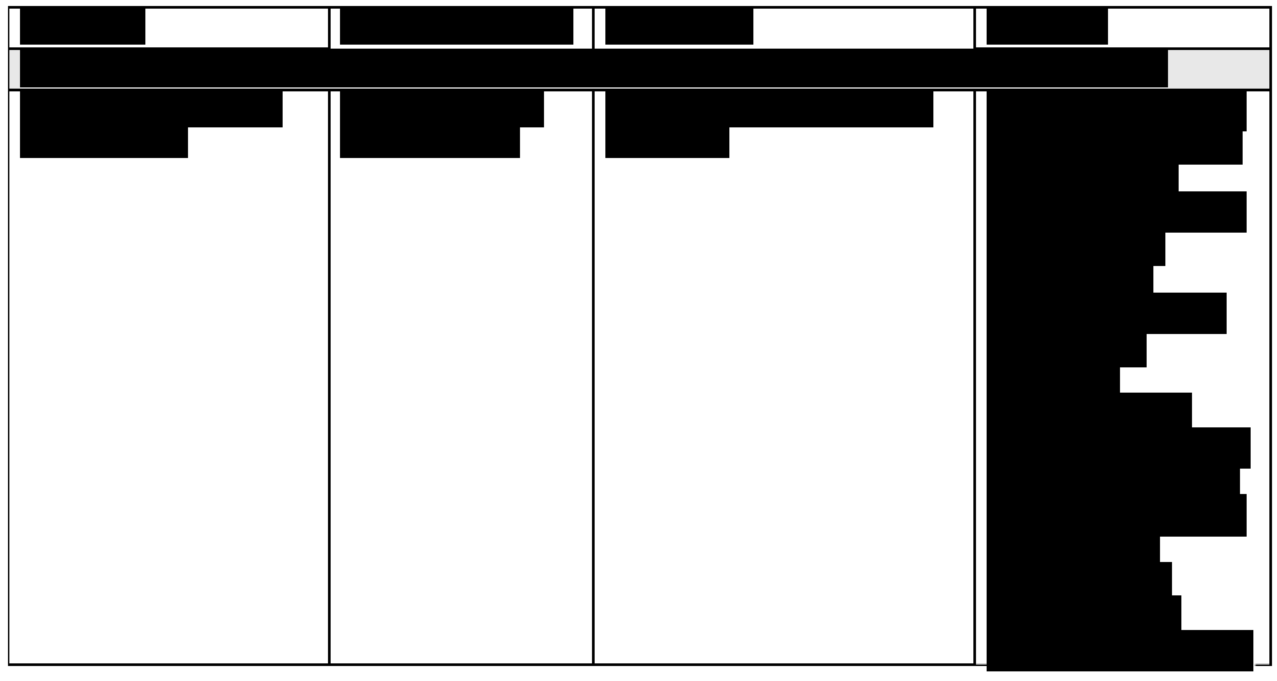

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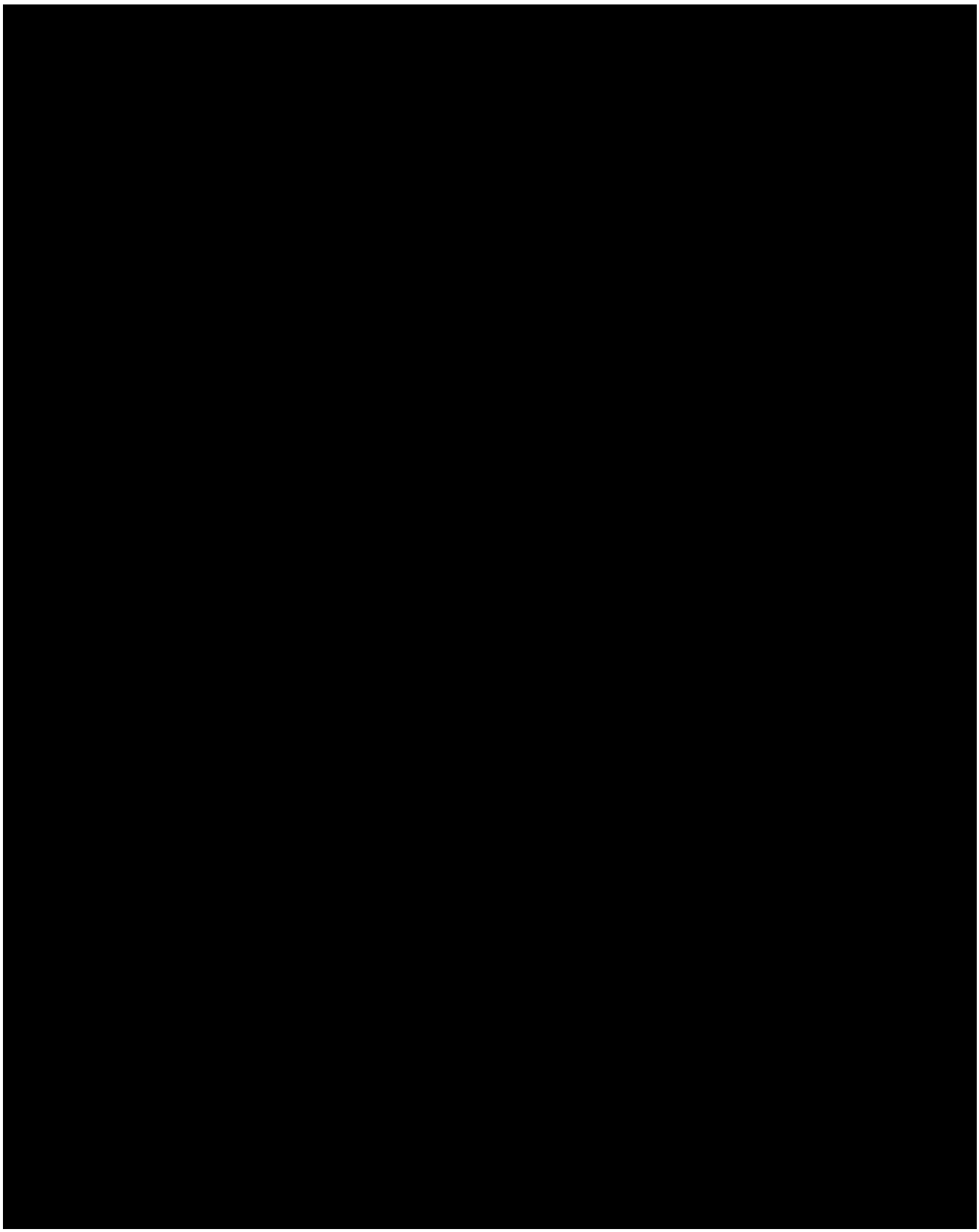

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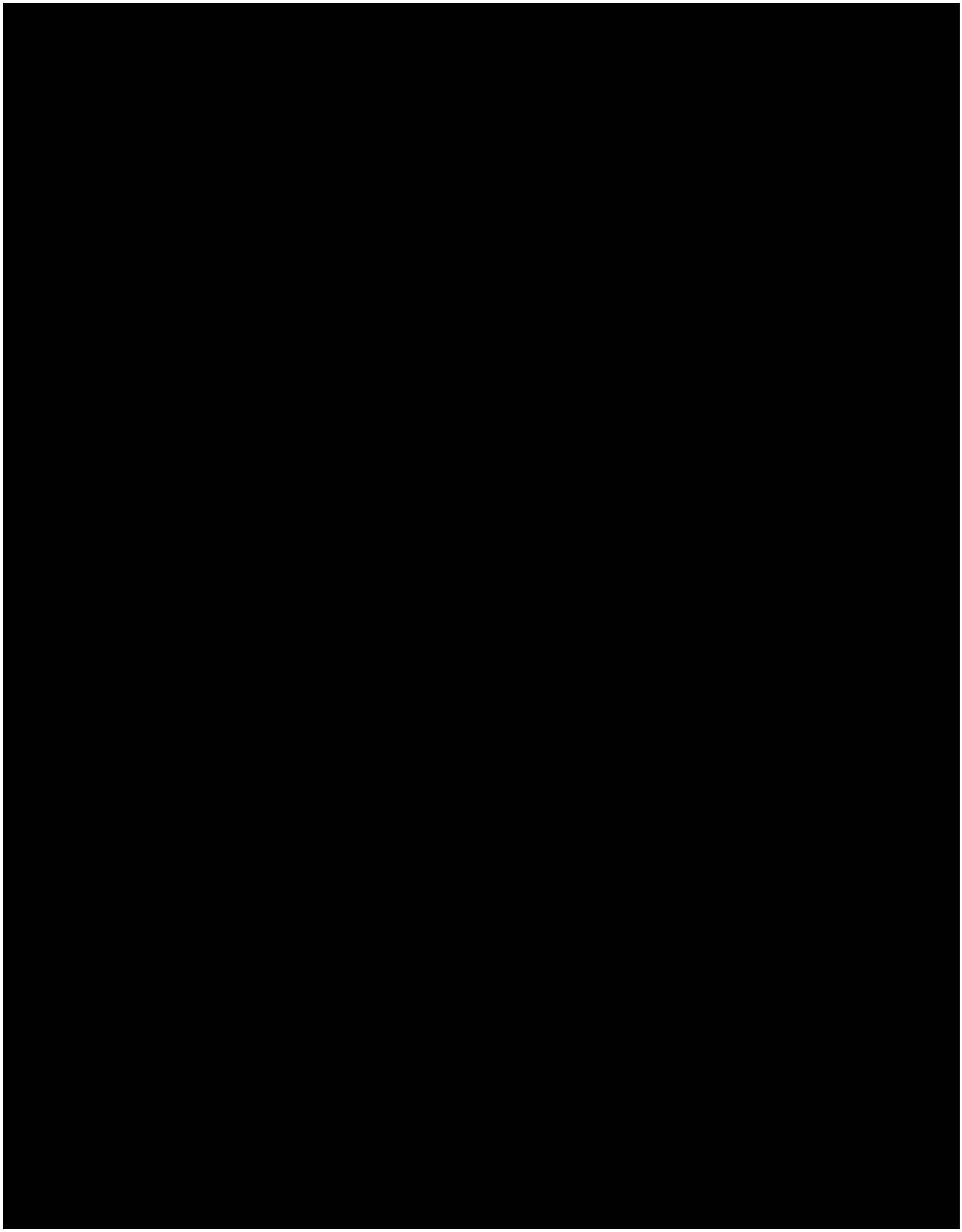

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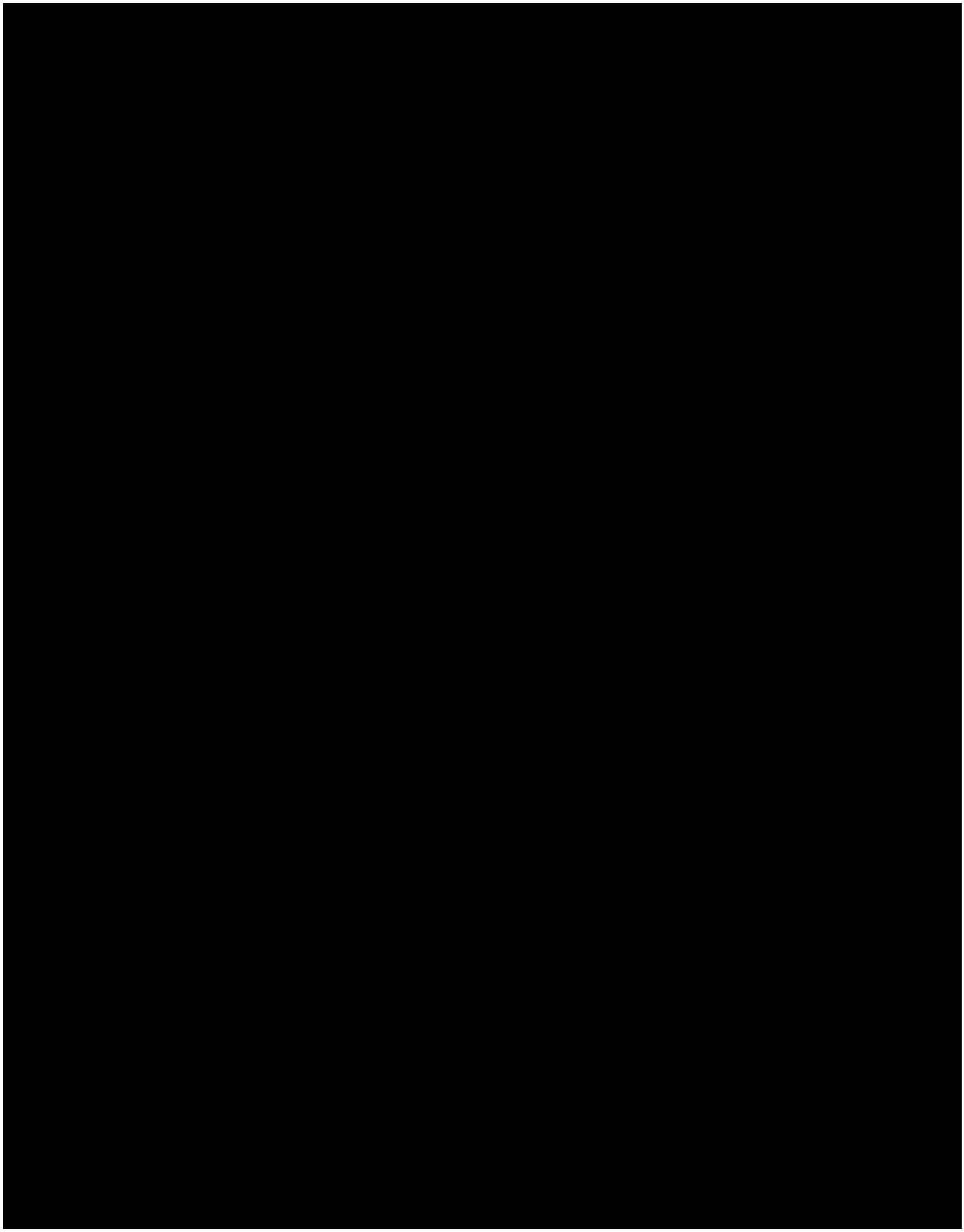

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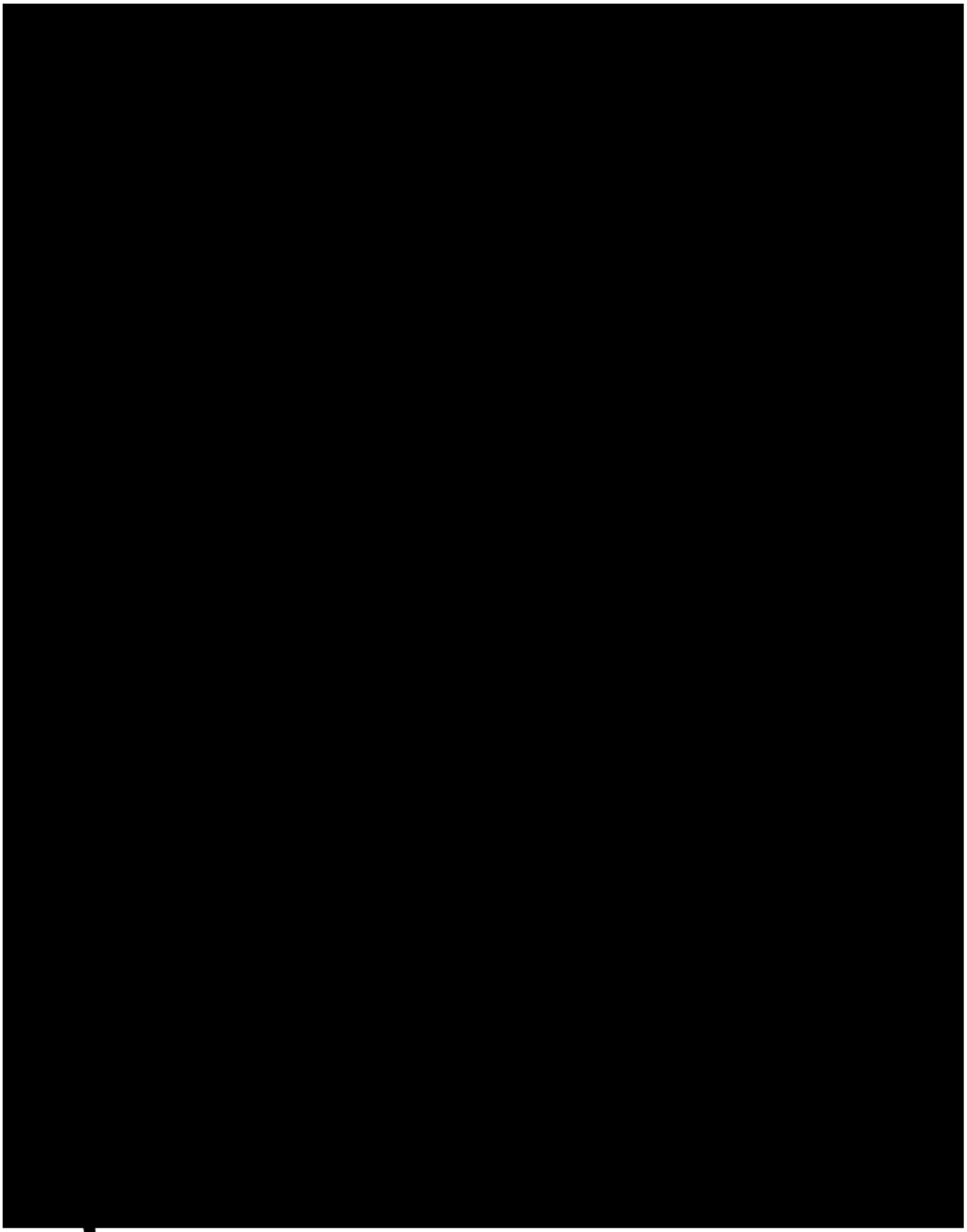

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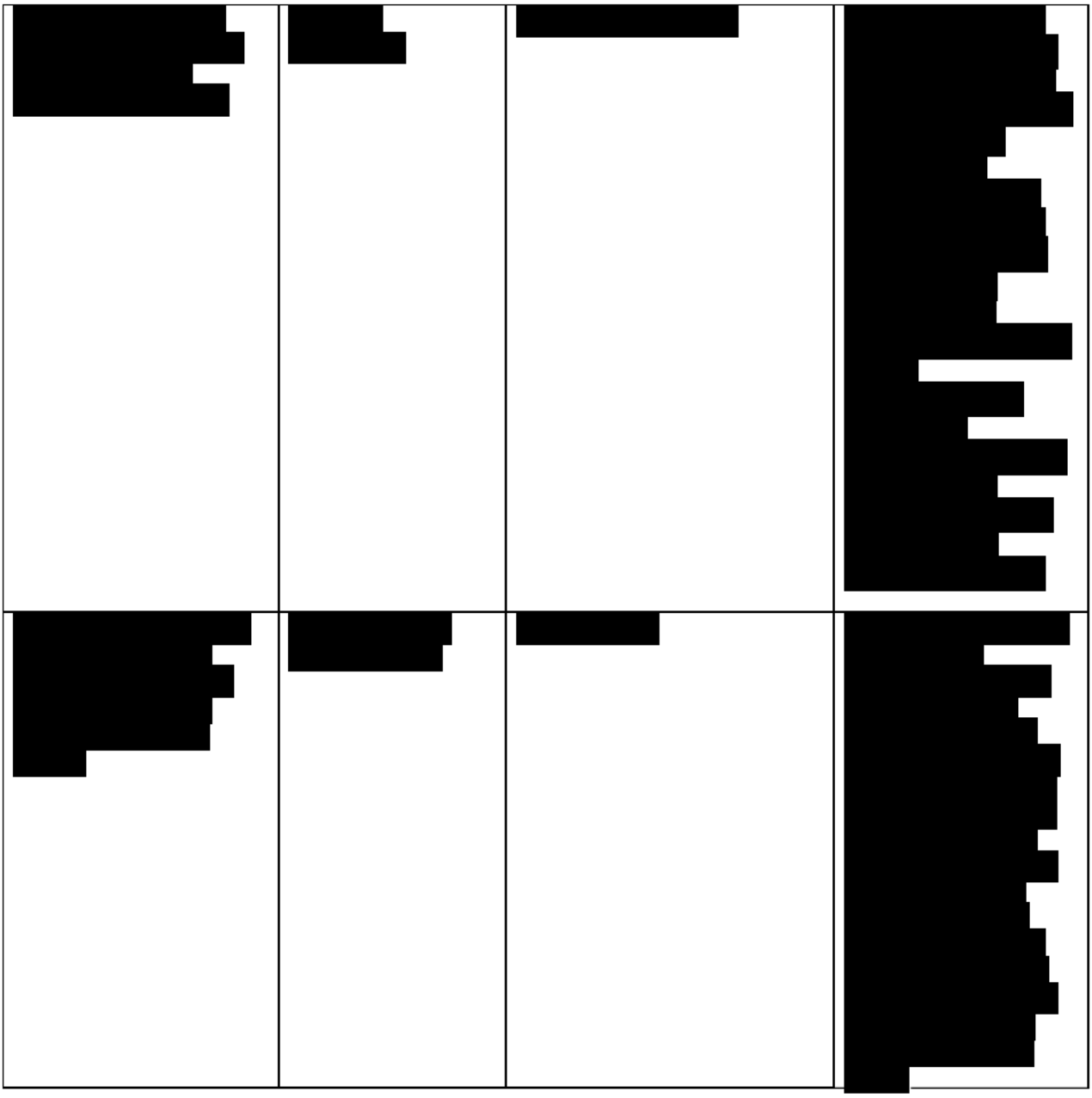

Case example 2 (R.34)

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Appendix 2

Full reference list

Citation	Participant age group	Impairment (primary)	Impairment (secondary)	Research design	language & communication	mobility & movement	interpersonal interactions	functioning (inc. psychosocial functioning)	community living	personal care
Aalbers, S., Fusar-Poli, L., Freeman, R. E., Spreen, M., Ket, J. C., Vink, A. C., ... & Gold, C. (2017). Music therapy for depression. Cochrane database of systematic reviews, (11). https://doi.org/10.1002/14651858.CD004517.pub3	Mixed ages	Psychosocial		Systematic review / meta-analysis				x		
Applewhite, B., Cankaya, Z., Heiderscheit, A., & Himmerich, H. (2022). A systematic review of scientific studies on the effects of music in people with or at risk for autism spectrum disorder. *International Journal of Environmental Research and Public Health, 19*(9), 5150. https://doi.org/10.3390/ijerph19095150	Mixed ages	Sensory		Systematic review / meta-analysis	x			x		
Asiru, A. B. (2022). Music Therapy for Individuals with Intellectual Disability: A Systematic Review. International Journal of Early Childhood, 14(02), 2022. (no doi available)	Mixed ages	Intellectual		Systematic review / meta-analysis				x		
Barnish, M. S., & Barran, S. M. (2020). A systematic review of active group-based dance, singing, music therapy and theatrical interventions for quality of life, functional communication, speech, motor function and cognitive status in people with Parkinson's disease. BMC neurology, 20, 1-15. doi:10.1186/s12883-020-01938-3	Older adults	Neurological		Systematic review / meta-analysis		x		x		

Bharathi, G., Jayaramayya, K., Balasubramanian, V., & Vellingiri, B. (2019). The potential role of rhythmic entrainment and music therapy intervention for individuals with autism spectrum disorders. Journal of exercise rehabilitation, 15(2), 180–186. doi:10.12965/jer.1836578.289	Children	Neurological	Psychosocial	Systematic review / meta-analysis	x	x	x	x	x	
Bieleninik, Ł., Geretsegger, M., Mössler, K., Assmus, J., Thompson, G., Gattino, G., . . . Muratori, F. (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	Children	Neurological	Intellectual	Randomized controlled trial			x			
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. doi:10.1093/jmt/thaa015		Sensory	Physical	Systematic review / meta-analysis	x		x			
Bower, J., Catroppa, C., Grocke, D., & Shoemark, H. (2014). Music therapy for early cognitive rehabilitation post-childhood TBI: An intrinsic mixed methods case study. Developmental Neurorehabilitation, 17(5), 339–346. https://doi.org/10.3109/17518423.2013.778910	Children	Cognitive	Physical	Mixed methods	x	x	x	x		
Bukowska, A. A., Krężałek, P., Mirek, E., Bujas, P., & Marchewka, A. (2016). Neurologic music therapy training for mobility and stability rehabilitation with Parkinson's disease – A pilot study. Frontiers in Human Neuroscience, 9. https://doi.org/10.3389/fnhum.2015.00710	Older adults	Neurological	Physical	Randomized controlled trial		x		x		
Burns, J., Healy, H., O'Connor, R., Moss, H., Sena Moore, K., & Jacobsen, S. L. (2024). Integrative Review of Music and Music Therapy Interventions on Functional Outcomes in Children with Acquired Brain	Children	Cognitive	Neurological	Systematic review / meta-analysis	x	x				

Injury. The Journal of Music Therapy. https://doi.org/10.1093/jmt/thae017										
Carpente, J. A. (2017). Investigating the Effectiveness of a Developmental, Individual Difference, Relationship-Based (DIR) Improvisational Music Therapy Program on Social Communication for Children with Autism Spectrum Disorder. *Music Therapy Perspectives*. https://doi.org/10.1093/mtp/miw013	Children	Psychosocial		Pre-post (pilot study)			x	x		
Chou, C. H., Chen, P. C., Huang, Y. C., Yang, T. H., Wang, L. Y., Chen, I. H., ... & Lee, Y. Y. (2024). Neurological music therapy for poststroke depression, activity of daily living and cognitive function: A pilot randomized controlled study. Nordic Journal of Music Therapy, 33(3), 226-237. doi:10.1080/08098131.2023.2280968	Adults	Neurological		Randomized controlled trial				x		x
Chou, M. Y., Chang, N. W., Chen, C., Lee, W. T., Hsin, Y. J., Siu, K. K., ... & Hung, P. L. (2019). The effectiveness of music therapy for individuals with Rett syndrome and their families. Journal of the Formosan Medical Association, 118(12), 1633-1643. doi:10.1016/j.jfma.2019.01.001	Children	Intellectual		Randomized controlled trial	x	x	x			
De Witte, M., Pinho, A. D. S., Stams, G. J., Moonen, X., Bos, A. E., & Van Hooren, S. (2022). Music therapy for stress reduction: a systematic review and meta-analysis. Health psychology review, 16(1), 134-159. https://doi.org/10.1080/17437199.2020.1846580	Adults	Psychosocial		Systematic review / meta-analysis				x		
Devlin, K., Alshaikh, J. T., & Pantelyat, A. (2019). Music therapy and music-based interventions for movement disorders. Current Neurology and Neuroscience Reports, 19(11), 1-13. doi:https://doi.org/10.1007/s11910-019-1005-0				Systematic review / meta-analysis		x				

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	Children	Neurological	Sensory	Qualitative study			x	x		
Fan, Q., Ding, M., Cheng, W., Su, L., Zhang, Y., Liu, Q., & Wu, Z. (2024). The clinical effects of Orff music therapy on children with autism spectrum disorder: a comprehensive evaluation. Frontiers in Neurology, 15, 1387060-. https://doi.org/10.3389/fneur.2024.1387060	Infants	Cognitive	Psychosocial	Non-randomized controlled study	x	x	x			
Feng, K., Shen, C. Y., Ma, X. Y., Chen, G. F., Zhang, M. L., Xu, B., ... & Ju, Y. (2019). Effects of music therapy on major depressive disorder: A study of prefrontal hemodynamic functions using fNIRS. Psychiatry research, 275, 86-93. doi:https://doi.org/10.1016/j.psychres.2019.03.015	Adults	Psychosocial		Pre-post (pilot study)	x			x		
Gardiner, J. C., & Horwitz, J. L. (2015). Neurologic music therapy and group psychotherapy for treatment of traumatic brain injury: Evaluation of a cognitive rehabilitation group. Music Therapy Perspectives, miu045. doi: 10.1093/mtp/miu045	Adults	Psychosocial		Pre-post (pilot study)			x	x		
Gardiner, J. C., & Horwitz, J. L. (2015). Neurologic music therapy and group psychotherapy for treatment of traumatic brain injury: Evaluation of a cognitive rehabilitation group. Music Therapy Perspectives, 33(2), 193–201. https://doi.org/10.1093/mtp/miu045	Adults	Cognitive		Pre-post (pilot study)				x		
Gassner, L., Geretsegger, M., & Mayer-Ferbas, J. (2021). Effectiveness of music therapy for autism spectrum disorder, dementia, depression, insomnia, and schizophrenia: Update of systematic reviews. *European Journal of Public Health, 32*(1), 27–34. https://doi.org/10.1093/eurpub/ckab042	Mixed ages	Psychosocial		Systematic review / meta-analysis	x		x	x	x	

Gattino, G. S., Riesgo, R. dos S., Longo, D., Leite, J. C. L., & Faccini, L. S. (2011). Effects of relational music therapy on communication of children with autism: a randomized controlled study. *Nordic Journal of Music Therapy*, *20*(2), 142–154. https://doi.org/10.1080/08098131.2011.566933	Children	Psychosocial		Randomized controlled trial	x					
Geretsegger, M., Fusar-Poli, L., Elefant, C., Mössler, K. A., Vitale, G., & Gold, C. (2022). Music therapy for autistic people. Cochrane Database of Systematic Reviews, (5). https://doi.org/10.1002/14651858.CD004381.pub4	Mixed ages	Neurological	Cognitive	Systematic review / meta-analysis				x		
Geretsegger, M., Mössler, K. A., Bieleninik, Ł., Chen, X. J., Heldal, T. O., & Gold, C. (2017). Music therapy for people with schizophrenia and schizophrenia-like disorders. Cochrane Database of Systematic Reviews, (5). https://doi.org/10.1002/14651858.CD004025.pub4	Adults	Psychosocial		Systematic review / meta-analysis				x		
Ghai, S. (2023). Does Music Therapy Improve Gait after Traumatic Brain Injury and Spinal Cord Injury? A Mini Systematic Review and Meta-Analysis. Brain Sciences (2076-3425), 13(3), 522. https://doi.org/10.3390/brainsci13030522	Adults	Physical		Systematic review / meta-analysis		x				
Ghasemtabar, S. N., Hosseini, M., Fayyaz, I., Arab, S., Naghashian, H., & Poudineh, Z. (2015). Music therapy: An effective approach in improving social skills of children with autism. *Advanced Biomedical Research*, *4*(1), 157–157. https://doi.org/10.4103/2277-9175.161584	Children	Psychosocial		Non-randomized controlled study			x	x		
Gold, C., Mössler, K., Grocke, D., Heldal, T. O., Tjemsland, L., Aarre, T., ... & Rolvsjord, R. (2013). Individual music therapy for mental health care clients with low therapy motivation: Multicentre randomised controlled trial. Psychotherapy and Psychosomatics, 82(5), 319-331. https://doi.org/10.1159/000348452	Adults	Psychosocial		Randomized controlled trial			x	x	x	

Gold, C., Solli, H. P., Krüger, V., & Lie, S. A. (2009). Dose–response relationship in music therapy for people with serious mental disorders: Systematic review and meta-analysis. Clinical psychology review, 29(3), 193-207. https://doi.org/10.1016/j.cpr.2009.01.001	Adults	Psychosocial		Systematic review / meta-analysis				x		
Gold, C., Voracek, M., & Wigram, T. (2004). Effects of music therapy for children and adolescents with psychopathology: A meta-analysis. Journal of Child Psychology and Psychiatry, 45(6), 1054-1063. https://doi.org/10.1111/j.1469-7610.2004.t01-1-00298.x	Adolescents	Psychosocial		Systematic review / meta-analysis				x		
Graham, J. (2004). Communication with the uncommunicative: Music therapy with pre-verbal adults. British Journal of Learning Disabilities, 32(1), 24-29. doi: 10.1111/j.1468-3156.2004.00247	Adults	Cognitive	Psychosocial	Case study	x		x	x		
Grocke, D., Bloch, S., Castle, D., Thompson, G., Newton, R., Stewart, S., & Gold, C. (2014). Group music therapy for severe mental illness: a randomized embedded-experimental mixed methods study. Acta Psychiatrica Scandinavica, 130(2), 144-153. https://doi.org/10.1111/acps.12224	Adults	Psychosocial		Randomized controlled trial				x		
Groß W, Linden U, Ostermann T. (2010). Effects of music therapy in the treatment of children with delayed speech development - results of a pilot study. BMC Complementary and Alternative Medicine. 10(1),39. doi: 10.1186/1472-6882-10-39	Children	Cognitive		Within-subject design	x					
Guetin, S., Soua, B., Voiriot, G., Picot, M.C., & Herisson, C. (2009). The effect of music therapy on mood and anxiety-depression: an observational study in institutionalized patients with traumatic brain injury. Annals of Physical & Rehabilitation Medicine, 52, 30-40. doi: 10.1016/j.annrmp.2008.08.009	Adults	Neurological	Psychosocial	Within-subject design				x		

Haire, C. M., Vuong, V., Tremblay, L., Patterson, K. K., Chen, J. L., & Thaut, M. H. (2021). Effects of therapeutic instrumental music performance and motor imagery on chronic post-stroke cognition and affect: A randomized controlled trial. NeuroRehabilitation, 48(2), 195-208. doi:10.3233/nre-208014	Adults	Neurological		Randomized controlled trial			x	x		
Hakvoort, L., Bogaerts, S., Thaut, M. H., & Spreen, M. (2015). Influence of music therapy on coping skills and anger management in forensic psychiatric patients: An exploratory study. *International Journal of Offender Therapy and Comparative Criminology, 59*(8), 810–836. https://doi.org/10.1177/0306624x13516787	Adults	Psychosocial	Cognitive	Randomized controlled trial	x		x			
Hense, C., McFerran, K. S., & McGorry, P. (2014). Constructing a grounded theory of young people's recovery of musical identity in mental illness. *The Arts in Psychotherapy, 41*(5), 594–603. https://doi.org/10.1016/j.aip.2014.10.010	Young adults	Psychosocial	Cognitive	Qualitative study	x		x	x		
Huang, C., & Gu, S. (2024). Effectiveness of music therapy in enhancing empathy and emotional recognition in adolescents with intellectual disabilities. Acta Psychologica, 243, 104152–104152. https://doi.org/10.1016/j.actpsy.2024.104152	Adolescents	Psychosocial		Randomized controlled trial			x			
Hurkmans, J., Jonkers, R., de Bruijn, M., Boonstra, A. M., Hartman, P. P., Arendzen, H., & Reinders-Messelink, H. A. (2015). The effectiveness of Speech–Music Therapy for Aphasia (SMTA) in five speakers with Apraxia of Speech and aphasia. Aphasiology, 29(8), 939-964. https://doi.org.au/10.1080/02687038.2015.1006565	Mixed ages	Neurological			x					
Hurt, C.P., Rice, R.R., McIntosh, G.C., & Thaut, M.H. (1998). Rhythmic auditory stimulation in gait training for patients with traumatic brain injury. Journal of Music	Adults	Neurological	Physical	Pre-post (pilot study)		x		x		

Therapy, 35(4), 228-241. https://doi.org/10.1093/jmt/35.4.228										
James, R., Sigafoos, J., Green, V. A., Lancioni, G. E., O'Reilly, M. F., Lang, R., Davis, T., Carnett, A., Achmadi, D., Gevarter, C., & Marschik, P. B. (2015). Music therapy for individuals with Autism Spectrum Disorder: a systematic review. Review Journal of Autism and Developmental Disorders, 2(1), 39–54. https://doi.org/10.1007/s40489-014-0035-4	Mixed ages	Psychosocial		Systematic review / meta-analysis	x		x	x		
Jia, R., Liang, D., Yu, J., Lu, G., Wang, Z., Wu, Z., ... & Chen, C. (2020). The effectiveness of adjunct music therapy for patients with schizophrenia: A meta-analysis. *Psychiatry Research,* 293, 113464. doi:10.1016/j.psychres.2020.113464	Adults	Psychosocial		Systematic review / meta-analysis				x		
Johansson, A. M., Domellöf, E., & Rönnqvist, L. (2012). Short- and long-term effects of synchronized metronome training in children with hemiplegic cerebral palsy: A two case study. *Developmental Neurorehabilitation, 15*(2), 160–169. https://doi.org/10.3109/17518423.2011.635608	Children	Physical		Case study				x		
Johnels, L., Vehmas, S., & Wilder, J. (2023). Musical interaction with children and young people with severe or profound intellectual and multiple disabilities: a scoping review. *International Journal of Developmental Disabilities*, *69*(4), 487–504. https://doi.org/10.1080/20473869.2021.1959875	Children	Intellectual	Physical	Systematic review / meta-analysis	x		x	x		
Ke, X., Song, W., Yang, M., Li, J., & Liu, W. (2022). Effectiveness of music therapy in children with autism spectrum disorder: A systematic review and meta-analysis. Frontiers in Psychiatry, 13, 905113. https://doi.org/10.3389/fpsyt.2022.905113	Children	Neurological		Systematic review / meta-analysis			x			

Kern, P., Wolery, M., & Aldridge, D. (2007). Use of songs to promote independence in morning greeting routines for young children with autism. *Journal of Autism and Developmental Disorders, 37*(7), 1264–1271. https://doi.org/10.1007/s10803-006-0272-1	Infants	Intellectual	Psychosocial	Case study	x		x	x		
Kim, J., Wigram, T., & Gold, C. (2009). Emotional, motivational and interpersonal responsiveness of children with autism in improvisational music therapy. Autism : The International Journal of Research and Practice, 13(4), 389–409. https://doi.org/10.1177/1362361309105660	Children	Psychosocial		Within-subject design			x			
Knott, D. (2015). Musical Mnemonics Training: Proposed Mechanisms and Case Example with Acquired Brain Injury. Music Therapy Perspectives, miv016. doi: 10.1093/mtp/miv016	Adolescents	Neurological	Cognitive	Case study	x			x		
Knox, R., Yokota-Adachi, H., Kershner, J., & Jutai, J. (2003). Musical attention training program and alternating attention in brain injury: An initial report. Music Therapy Perspectives, 21, 99-104. doi: 10.1093/mtp/21.2.99	Adolescents	Neurological	Cognitive	Pre-post (pilot study)				x		
Kwak, E.E. (2007). Effect of rhythmic auditory stimulation on gait performance in children with spastic cerebral palsy. Journal of Music Therapy, 44(3), 198-216. https://doi.org/10.1093/jmt/44.3.198	Children	Physical	Neurological	Randomized controlled trial		x		x		
LaGasse, A. B. (2014). Effects of a music therapy group intervention on enhancing social skills in children with autism. Journal of Music Therapy, 51(3), 250–275. https://doi.org/10.1093/jmt/thu012	Children	Cognitive	Psychosocial	Randomized controlled trial	x		x	x		
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. https://doi.org/10.2147/PROM.S106267	Children	Cognitive					x	x		
Lam, H. L., Li, W. T. V., Laher, I., & Wong, R. Y. (2020). Effects of music therapy on patients with dementia—A systematic	Older adults	Neurological		Systematic review / meta-analysis	x		x	x		

review. Geriatrics, 5(4), 62. https://doi.org/10.3390/geriatrics5040062										
Lee, J.- young, & McFerran, K. (2012). The Improvement of Non-Verbal Communication Skills of Five Females with Profound and Multiple Disabilities Using Song-Choices in Music Therapy. Voices: A World Forum for Music Therapy, 12(3). https://doi.org/10.15845/voices.v12i3.644	Adults	Physical	Intellectual	Pre-post (pilot study)	x		x			
Lici, E., Avdulaj, E., Zhapaj, A., & Lamaj, P. D. I. (2024). The Effect Of Music Education On The Development Of Students With Autism Spectrum Disorders And Intellectual Disabilities: A Systematic Review Of The Literature. Educational Administration: Theory and Practice, 30(5), 2229-2238. https://kuey.net/index.php/kuey/article/view/3269/2083	Adolescents	Intellectual	Neurological	Systematic review / meta-analysis	x		x	x		
Lim, H. A., & Draper, E. (2011). The effects of music therapy incorporated with applied behavior analysis verbal behavior approach for children with Autism Spectrum Disorders. *The Journal of Music Therapy*, *48*(4), 532–550. https://doi.org/10.1093/jmt/48.4.532	Children	Cognitive	Psychosocial	Randomized controlled trial	x					
Lim, K. B., Kim, Y. K., Lee, H. J., Yoo, J., Hwang, J. Y., Kim, J. A., & Kim, S. K. (2013). The therapeutic effect of neurologic music therapy and speech language therapy in post-stroke aphasic patients. Annals of rehabilitation medicine, 37(4), 556-562. doi:10.5535/arm.2013.37.4.556	Older adults	Neurological		Randomized controlled trial	x					
Liu, Q., Li, W., Yin, Y., Zhao, Z., Yang, Y., Zhao, Y., ... & Yu, J. (2022). The effect of music therapy on language recovery in patients with aphasia after stroke: a systematic review and meta-analysis. Neurological Sciences, 1-10. doi:10.1007/s10072-021-05743-9	Older adults	Neurological		Systematic review / meta-analysis	x			x		

Lopes, J., & Keppers, I. I. (2021). Music-based therapy in rehabilitation of people with multiple sclerosis: a systematic review of clinical trials. Arquivos de Neuro-Psiquiatria, 79(6), 527-535. http://dx.doi.org/10.1590/0004-282X-ANP-2020-0374	Adults	Neurological	Physical	Systematic review / meta-analysis		x		x		
Low, B., Liu, X., Li, R. Z., Ren, E., & Zhang, J. X. (2024, October). Music Therapy for Autism Spectrum Disorder: A Comprehensive Literature Review on Therapeutic Efficacy, Limitations, and AI Integration. In 2024 IEEE 15th Annual Ubiquitous Computing, Electronics & Mobile Communication Conference (UEMCON) (pp. 90-99). IEEE. https://doi.org./10.1109/UEMCON62879.2024.10754769	Children	Neurological		Systematic review / meta-analysis			x			
Lu, G., Jia, R., Liang, D., Yu, J., Wu, Z., & Chen, C. (2021). Effects of music therapy on anxiety: A meta-analysis of randomized controlled trials. *Psychiatry Research, 304*, 114137. https://doi.org/10.1016/j.psychres.2021.114137	Mixed ages	Psychosocial		Systematic review / meta-analysis				x		
Ma, Y., Nagler, J., Lee, M., & Cabrera, I. (2001). Impact of music therapy on the communication skills of toddlers with pervasive developmental disorder. Annals of the New York Academy of Sciences, 930, 445-447. doi: 10.1111/j.1749-6632.2001.tb05766.x	Children	Cognitive		Case study	x		x	x		
Machado Sotomayor, M. J., Arufe-Giráldez, V., Ruíz-Rico, G., & Navarro-Patón, R. (2021). Music therapy and Parkinson's disease: A systematic review from 2015–2020. International Journal of Environmental Research and Public Health, 18(21), 11618. https://doi.org/10.3390/ijerph182111618	Adults	Neurological		Systematic review / meta-analysis	x	x		x		
Magee, W. L., & Davidson, J. W. (2002). The effect of music therapy on mood states in neurological patients: a pilot study. Journal of music therapy, 39(1), 20-29.	Adults	Neurological		Pre-post (pilot study)				x		

Magee, W. L., Baker, F., Daveson, B., et al. (2011). Music therapy methods with children, adolescents, and adults with severe neurobehavioral disorders due to brain injury. *Music Therapy Perspectives, 29*(1), 5–13. https://doi.org/10.1093/mtp/29.1.5	Children	Neurological	Psychosocial	Case study	x		x	x		
Magee, W. L., Clark, I., Tamplin, J., & Bradt, J. (2017). Music interventions for acquired brain injury. Cochrane Database of Systematic Reviews. https://doi.org/10.1002/14651858.CD006787.pub3	Adults	Physical	Cognitive	Systematic review / meta-analysis	x	x		x		
Marquez-Garcia, A. V., Magnuson, J., Morris, J., Iarocci, G., Doesburg, S., & Moreno, S. (2022). Music therapy in Autism Spectrum Disorder: a systematic review. Review Journal of Autism and Developmental Disorders, 9(1), 91–107. https://doi.org/10.1007/s40489-021-00246-x	Mixed ages	Psychosocial	Sensory	Systematic review / meta-analysis	x		x	x		
Martínez-Molina, N., Siponkoski, S.-T., & Särkämö, T. (2022). Cognitive efficacy and neural mechanisms of music-based neurological rehabilitation for traumatic brain injury. Annals of the New York Academy of Sciences, 1515(1), 20–32. https://doi.org/10.1111/nyas.14800	Adults	Cognitive	Neurological	Randomized controlled trial				x		
Martínez-Vérez, V., Gil-Ruíz, P., & Domínguez-Lloria, S. (2024). Interventions through art therapy and music therapy in autism spectrum disorder, ADHD, language disorders, and learning disabilities in pediatric-aged children: A systematic review. Children, 11(6), Article 706. https://doi.org/10.3390/children11060706	Children	Neurological	Sensory	Systematic review / meta-analysis	x		x	x		
Mateos-Moreno, D., & Atencia-Doña, L. (2013). Effect of a combined dance/movement and music therapy on young adults diagnosed with severe autism. *The Arts in Psychotherapy*, *40*(5), 465–472. https://doi.org/10.1016/j.aip.2013.09.004	Young adults	Psychosocial		Non-randomized controlled study				x		

McDermott, O., Crellin, N., Ridder, H. M., & Orrell, M. (2013). Music therapy in dementia: a narrative synthesis systematic review. International journal of geriatric psychiatry, 28(8), 781-794.	Older adults	Neurological		Systematic review / meta-analysis			x	x		
McFerran, K. S., & Shoemark, H. (2013). How musical engagement promotes well-being in education contexts: The case of a young man with profound and multiple disabilities. International journal of qualitative studies on health and well-being, 8(1), 20570. doi:10.3402/qhw.v8i0.20570	Adolescents	Intellectual	Physical	Case study			x			
McFerran, K., Thompson, G., & Bolger, L. (2016). The impact of fostering relationships through music within a special school classroom for students with autism spectrum disorder: an action research study. Educational Action Research, 24(2), 241-259. https://doi.org/10.1080/09650792.2015.1058171	Children	Neurological	Intellectual	Mixed methods			x			
Mishra, R., Florez-Perdomo, W. A., Shrivatava, A., Chouksey, P., Raj, S., Moscote-Salazar, L. R., ... & Agrawal, A. (2021). Role of music therapy in traumatic brain injury: A systematic review and meta-analysis. World neurosurgery, 146, 197-204. https://doi.org/10.1016/j.wneu.2020.10.130	Adults	Physical	Cognitive	Systematic review / meta-analysis		x		x		
Moore, K.S., Peterson, D.A., O'Shea, G., McIntosh, G.C., & Thaut, M.H. (2008). The effectiveness of music as a mnemonic device on recognition memory for people with multiple sclerosis. Journal of Music Therapy, 45, 307-329. doi: 10.1093/jmt/45.3.307	Adults	Cognitive		Randomized controlled trial	x			x		
Mossler, K., Gold, C., Assmus, J., Schumacher, K., Calvet, C., Reimer, S., . . . Schmid, W. (2019). The therapeutic relationship as predictor of change in music therapy with young children with Autism Spectrum Disorder. *Journal of Autism and Developmental Disorders,*	Children	Psychosocial		Pre-post (pilot study)			x			

49(7), 2795-2809. doi:10.1007/s10803-017-3306-y										
Park, J. I., Lee, I. H., Lee, S. J., Kwon, R. W., Choo, E. A., Nam, H. W., & Lee, J. B. (2023). Effects of music therapy as an alternative treatment on depression in children and adolescents with ADHD by activating serotonin and improving stress coping ability. BMC complementary medicine and therapies, 23(1), 73. https://doi.org/10.1186/s12906-022-03832-6	Adolescents	Neurological	Psychosocial	Randomized controlled trial				x		
Pasiali, V., LaGasse, A. B., & Penn, S. L. (2014). The effect of musical attention control training (MACT) on attention skills of adolescents with neurodevelopmental delays: A pilot study. Journal of music therapy, 51(4), 333-354. doi:10.1093/jmt/thu030	Children	Sensory		Pre-post (pilot study)				x		
Pavlicevic, M., O'Neil, N., Powell, H., Jones, O., & Sampathianaki, E. (2014). Making music, making friends: Long-term music therapy with young adults with severe learning disabilities. Journal of intellectual disabilities, 18(1), 5-19. doi:10.1177/1744629513511354	Young adults	Intellectual	Psychosocial	Qualitative study			x	x	x	
Peng, Y.-C., Lu, T.-W., Wang, T.-H., Chen, Y.-L., Liao, H.-F., Lin, K.-H., & Tang, P.-F. (2011). Immediate effects of therapeutic music on loaded sit-to-stand movement in children with spastic diplegia. Gait & Posture, 33(2), 274–278. https://doi.org/10.1016/j.gaitpost.2010.11.020						x				
Rabeyron, T., Robledo Del Canto, J. P., Carasco, E., & et al. (2020). A randomized controlled trial of 25 sessions comparing music therapy and music listening for children with autism spectrum disorder. *Psychiatry Research, 293*, 113377.	Children	Psychosocial	Cognitive	Randomized controlled trial	x		x	x		

https://doi.org/10.1016/j.psychres.2020.113377										
Raghavan, P., Geller, D., Guerrero, N., Aluru, V., Eimicke, J. P., Teresi, J. A., ... & Turry, A. (2016). Music upper limb therapy—integrated: an enriched collaborative approach for stroke rehabilitation. Frontiers in Human Neuroscience, 10, 498. doi:10.3389/fnhum.2016.00498	Adults	Intellectual		Non-randomized controlled study		x		x		
Raglio, A., Oasi, O., Gianotti, M., Rossi, A., Goulene, K., & Stramba-Badiale, M. (2016). Improvement of spontaneous language in stroke patients with chronic aphasia treated with music therapy: a randomized controlled trial. International Journal of Neuroscience, 126(3), 235-242. doi:10.3109/00207454.2015.1010647	Older adults	Neurological		Randomized controlled trial	x					
Salomon-Gimmon, M., & Elefant, C. (2019). Development of vocal communication in children with autism spectrum disorder during improvisational music therapy. Nordic Journal of Music Therapy, 28(3), 174-192. doi:10.1080/08098131.2018.1529698	Children	Sensory	Psychosocial	Case study	x					
Senkal, O. A., & Muhtar, Z. (2021). Role of orff music therapy in improving auditory processing skills in children with intellectual disability. Nigerian Journal of Clinical Practice, 24(7), 1005-1014. https://doi.org.au/10.4103/njcp.njcp_410_20	Adolescents	Intellectual		Randomized controlled trial	x					
Sharda, M., Tuerk, C., Chowdhury, R., Jamey, K., Foster, N., Custo-Blanch, M., ... & Hyde, K. (2018). Music improves social communication and auditory–motor connectivity in children with autism. Translational psychiatry, 8(1), 231. doi:10.1038/s41398-018-0287-3	Children	Sensory	Psychosocial	Randomized controlled trial	x		x	x		

Shi, Z. M., Lin, G. H., & Xie, Q. (2016). Effects of music therapy on mood, language, behavior, and social skills in children with autism: A meta-analysis. Chinese Nursing Research, 3(3), 137-141. https://doi.org/10.1016/j.cnre.2016.06.018	Children	Sensory		Systematic review / meta-analysis	x		x	x		
Sihvonen, A. J., Siponkoski, S.-T., Martinez-Molina, N., Laitinen, S., Holma, M., Ahlfors, M., Kuusela, L., Pekkola, J., Koskinen, S., & Sarkamo, T. (2022). Neurological Music Therapy Rebuilds Structural Connectome after Traumatic Brain Injury: Secondary Analysis from a Randomized Controlled Trial. JOURNAL OF CLINICAL MEDICINE, 11(8), 2184. https://doi.org/10.3390/jcm11082184	Adults	Cognitive		Randomized controlled trial				x		
Silverman, M. J. (2007). The effect of paired pitch, rhythm, and speech on working memory as measured by sequential digit recall. Journal of Music Therapy, 44(4), 415-427. https://doi.org.au/10.1093/jmt/44.4.415	Adults	Cognitive		Within-subject design				x		
Simpson, K., & Keen, D. (2011). Music interventions for children with autism: Narrative review of the literature. Journal of autism and developmental disorders, 41, 1507-1514. https://doi.org/10.1007/s10803-010-1172-y	Children	Neurological		Systematic review / meta-analysis	x		x	x		
Siponkoski, S. T., Martínez-Molina, N., Kuusela, L., Laitinen, S., Holma, M., Ahlfors, M., ... & Särkämö, T. (2020). Music therapy enhances executive functions and prefrontal structural neuroplasticity after traumatic brain injury: evidence from a randomized controlled trial. Journal of neurotrauma, 37(4), 618-634. doi:10.1089/neu.2019.6413	Adults	Neurological		Randomized controlled trial				x		
Spiro, N., Tsiris, G., & Cripps, C. (2018). A systematic review of outcome measures in music therapy. Music Therapy Perspectives, 36(1), 67–78. https://doi.org/10.1093/mtp/mix011	Mixed ages			Systematic review / meta-analysis	x		x	x		

Tan, M., Friyia, S., Hurt-Thaut, C., Rizvi, S. J., & Thaut, M. H. (2025). Music-based cognitive training for adults with major depressive disorder and suicide risk: A pilot study. Journal of Clinical Medicine, 14(3), 757. https://doi.org/10.3390/jcm14030757	Adults	Cognitive	Psychosocial	Pre-post (pilot study)				x		
Thaut, M. H., Gardiner, J. C., Holmberg, D., Horwitz, J., Kent, L., Andrews, G., ... & McIntosh, G. R. (2009). Neurologic music therapy improves executive function and emotional adjustment in traumatic brain injury rehabilitation. Annals of the New York Academy of Sciences, 1169(1), 406-416. https://doi.org.au/10.1111/j.1749-6632.2009.04585.x	Adults	Neurological	Psychosocial	Pre-post (pilot study)				x		
Thaut, M. H., McIntosh, G. C., & Hoemberg, V. (2015). Neurobiological foundations of neurologic music therapy: Rhythmic entrainment and the motor system. Frontiers in Psychology, 5, 1185. https://doi.org/10.3389/fpsyg.2014.01185						x				
Thompson, G. (2017). 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	Children	Neurological	Intellectual	Qualitative study	x			x		
Thompson, G. A., McFerran, K. S., & Gold, C. (2014). Family-centred music therapy to promote social engagement in young children with severe autism spectrum disorder: A randomized controlled study. Child: Care, Health and Development, 40(6), 840-852. https://doi.org/10.1111/cch.12121	Children	Neurological	Intellectual	Randomized controlled trial			x			
Thompson, G., & McFerran, K. (2015). "We've got a special connection": Qualitative analysis of descriptions of change in the parent-child relationship by mothers of young children with autism spectrum disorder. Nordic Journal of Music Therapy, 24(1), 3-26.	Children	Neurological	Intellectual	Qualitative study			x			

https://doi.org/10.1080/08098131.2013.858762										
Thompson, G., & McFerran, K. (2015). Music therapy with young people who have profound intellectual and developmental disability: Four case studies exploring communication and engagement within musical interactions. Journal of Intellectual and Developmental Disabilities, 40(1), 1-11. https://doi.org/10.3109/13668250.2014.965668	Adolescents	Physical	Intellectual	Pre-post (pilot study)	x		x			
Thompson, Z., & Khalil-Salib, L. (2021). Online music therapy groups during COVID-19: Perspectives from NDIS participants and caregivers. *Australian Journal of Music Therapy, 32*(1), 53–63.	Adults	Cognitive	Intellectual	Mixed methods	x		x	x	x	
Tseng, P. T., Chen, Y. W., Lin, P. Y., et al. (2016). Significant treatment effect of adjunct music therapy to standard treatment on the positive, negative, and mood symptoms of schizophrenic patients: A meta-analysis. *BMC Psychiatry, 16*, 16. https://doi.org/10.1186/s12888-016-0718-8	Adults	Psychosocial	Cognitive	Systematic review / meta-analysis	x		x	x		
Tsirigoti, A., & Georgiadi, M. (2024). The efficacy of music therapy programs on the development of social communication in children with Autism Spectrum Disorder: A systematic review. *Education Sciences*, *14*(4), 373. https://doi.org/10.3390/educsci14040373	Children	Psychosocial		Systematic review / meta-analysis			x	x		
Twyford, K., Taylor, S., Valentine, J., Pool, J., Baron, A., & Thornton, A. (2024). Functional outcomes in children and adolescents with neurodisability accessing music therapy: A scoping review. Developmental Medicine and Child Neurology. https://doi.org/10.1111/dmcn.16135	Adolescents	Physical	Cognitive	Systematic review / meta-analysis	x	x		x		

Vaiouli, P., & Andreou, G. (2018). Communication and language development of young children with autism: A review of research in music. Communication Disorders Quarterly, 39(2), 323-329. doi:10.1177/1525740117705117	Children	Sensory	Psychosocial	Pre-post (pilot study)	x					
Van der Walt, M., & Baron, A. (2006). The role of music therapy in the treatment of a girl with pervasive refusal syndrome: exploring approaches to empowerment. Australian Journal of Music Therapy, 17, 35-53. https://www.proquest.com/scholarly-journals/role-music-therapy-treatment-girl-with-pervasive/docview/208663882/se-2	Children	Psychosocial	Intellectual	Case study						x
van Laar, C., Bloch-Atefi, A., Grace, J., & Zimmermann, A. (2025). Empowering voices—Learning from NDIS participants about the value of creative and experiential therapies: A mixed methods analysis of testimonials and academic literature. Psychotherapy and Counselling Journal of Australia. https://doi.org/10.59158/001c.128556	Mixed ages	Cognitive	Physical	Mixed methods	x	x	x	x		
Vinolo-Gil, M. J., Casado-Fernández, E., Perez-Cabezas, V., Gonzalez-Medina, G., Martín-Vega, F. J., & Martín-Valero, R. (2021). Effects of the combination of music therapy and physiotherapy in the improvement of motor function in cerebral palsy: A challenge for research. Children, 8(10), 868. doi:https://doi.org/10.3390/children8100868				Systematic review / meta-analysis		x				
Weller, C. M., & Baker, F. A. (2011). The role of music therapy in physical rehabilitation: a systematic literature review. Nordic Journal of Music Therapy, 20(1), 43-61. doi:10.1080/08098131.2010.485785	Mixed ages	Physical		Systematic review / meta-analysis		x		x		

Wheeler, B. L., Shiflett, S. C., & Nayak, S. (2003). Effects of number of sessions and group or individual music therapy on mood and behavior of people with stroke or traumatic brain injuries. Nordic Journal of Music Therapy, 12(2), 139-151. https://doi.org/10.1080/08098130309478084	Adults	Neurological	Psychosocial	Non-randomized controlled study		x	x	x		
Whipple, J. (2004). Music in intervention for children and adolescents with autism: A meta-analysis. Journal of music therapy, 41(2), 90-106. https://doi.org/10.1093/jmt/41.2.90	Children	Neurological		Systematic review / meta-analysis	x		x	x		
Windle, E., Hickling, L. M., Jayacodi, S., & Carr, C. (2020). The experiences of patients in the synchrony group music therapy trial for long-term depression. *The Arts in Psychotherapy, 67*, Article 101580. https://doi.org/10.1016/j.aip.2019.101580	Adults	Psychosocial	Psychosocial	Qualitative study	x			x	x	
Wolfe, D.E. & Noguchi, L.K. (2009). The use of music with young children to improve sustained attention during a vigilance task in the presence of auditory distractions. Journal of Music Therapy, 46, 69-83. https://doi.org.au/10.1093/jmt/46.1.69	Children	Cognitive	Sensory	Within-subject design				x		
Yanagiwara, S., Yasuda, T., Koike, M., Okamoto, T., Ushida, K., & Momosaki, R. (2022). Effects of music therapy on functional ability in people with cerebral palsy: a systematic review. Journal of Rural Medicine, 17(3), 101-107. doi:10.2185/jrm.2022-014	Children	Neurological		Systematic review / meta-analysis		x		x		
Yang, S., Suh, J. H., Kwon, S., & Chang, M. C. (2022). The effect of neurologic music therapy in patients with cerebral palsy: A systematic narrative review. Frontiers in Neurology, 13, 852277.										
Yang, S., Suh, J. H., Kwon, S., & Chang, M. C. (2022). The effect of neurologic music therapy in patients with cerebral palsy: A systematic narrative review. Frontiers in Neurology, 13, 852277. https://doi.org/10.3389/fneur.2022.852277	Mixed ages	Physical		Systematic review / meta-analysis		x				

Yasuhara, A., Sugiyama, Y. (2001). Music therapy for children with Rett Syndrome. Brain and Development, 23, (1), S82-84. doi: 10.1016/s0387-7604(01)00336-9	Children	Neurological	Cognitive	Case study	x	x	x			
Yoo, G. E., & Kim, S. J. (2018). Dyadic drum playing and social skills: Implications for rhythm-mediated intervention for children with Autism Spectrum Disorder. *The Journal of Music Therapy*, *55*(3), 340–375. https://doi.org/10.1093/jmt/thy013	Children	Psychosocial		Mixed methods	x		x			
Yoo, G.E., & Kim, S.J. (2016). Rhythmic auditory cueing in motor rehabilitation for stroke patients: Systematic review and meta-analysis. Journal of Music Therapy, 53(2), 149–177. https://doi.org/10.1093/jmt/thw003	Older adults	Neurological	Physical	Systematic review / meta-analysis		x		x		
Zhang, Y., Cai, J., An, L., et al. (2017). Does music therapy enhance behavioral and cognitive function in elderly dementia patients? A systematic review and meta-analysis. *Ageing Research Reviews, 35,* 1–11. https://doi.org/10.1016/j.arr.2016.12.003	Older adults	Neurological		Systematic review / meta-analysis			x	x		

Appendix 3

Functioning (including psychosocial functioning)

Citations: FUNCTIONING (including psychosocial functioning)	Participant age group	Impairment (primary)	Impairment (secondary)	Research design	language & communication	mobility & movement	interpersonal interactions	functioning (inc. psychosocial functioning)	community living	personal care
Aalbers, S., Fusar-Poli, L., Freeman, R. E., Spreen, M., Ket, J. C., Vink, A. C., ... & Gold, C. (2017). Music therapy for depression. Cochrane database of systematic reviews, (11). https://doi.org/10.1002/14651858.CD004517.pub3	Mixed ages	Psychosocial		Systematic review / meta-analysis				x		
Applewhite, B., Cankaya, Z., Heiderscheit, A., & Himmerich, H. (2022). A systematic review of scientific studies on the effects of music in people with or at risk for autism spectrum disorder. International Journal of Environmental Research and Public Health, 19(9), 5150. https://doi.org/10.3390/ijerph19095150	Mixed ages	Sensory		Systematic review / meta-analysis	x			x		
Asiru, A. B. (2022). Music Therapy for Individuals with Intellectual Disability: A Systematic Review. International Journal of Early Childhood, 14(02), 2022. (no doi available)	Mixed ages	Intellectual		Systematic review / meta-analysis				x		
Barnish, M. S., & Barran, S. M. (2020). A systematic review of active group-based dance, singing, music therapy and theatrical interventions for quality of life, functional communication, speech, motor function and cognitive status in people with Parkinson's disease. BMC neurology, 20, 1-15. doi:10.1186/s12883-020-01938-3	Older adults	Neurological		Systematic review / meta-analysis		x		x		
Bharathi, G., Jayaramayya, K., Balasubramanian, V., & Vellingiri, B. (2019). The potential role of rhythmic entrainment and music therapy intervention for individuals with autism spectrum disorders. Journal of exercise rehabilitation, 15(2), 180–186. doi:10.12965/jer.1836578.289	Children	Neurological	Psychosocial	Systematic review / meta-analysis	x	x	x	x	x	
Bower, J., Catroppa, C., Grocke, D., & Shoemark, H. (2014). Music therapy for early cognitive	Children	Cognitive	Physical	Mixed methods	x	x	x	x		

rehabilitation post-childhood TBI: An intrinsic mixed methods case study. Developmental Neurorehabilitation, 17(5), 339–346. https://doi.org/10.3109/17518423.2013.778910										
Bukowska, A. A., Krężałek, P., Mirek, E., Bujas, P., & Marchewka, A. (2016). Neurologic music therapy training for mobility and stability rehabilitation with Parkinson's disease – A pilot study. Frontiers in Human Neuroscience, 9. https://doi.org/10.3389/fnhum.2015.00710	Older adults	Neurological	Physical	Randomized controlled trial		x		x		
Carpente, J. A. (2017). Investigating the Effectiveness of a Developmental, Individual Difference, Relationship-Based (DIR) Improvisational Music Therapy Program on Social Communication for Children with Autism Spectrum Disorder. Music Therapy Perspectives. https://doi.org/10.1093/mtp/miw013	Children	Psychosocial		Pre-post (pilot study)			x	x		
Chou, C. H., Chen, P. C., Huang, Y. C., Yang, T. H., Wang, L. Y., Chen, I. H., ... & Lee, Y. Y. (2024). Neurological music therapy for poststroke depression, activity of daily living and cognitive function: A pilot randomized controlled study. Nordic Journal of Music Therapy, 33(3), 226-237. doi:10.1080/08098131.2023.2280968	Adults	Neurological		Randomized controlled trial				x		x
De Witte, M., Pinho, A. D. S., Stams, G. J., Moonen, X., Bos, A. E., & Van Hooren, S. (2022). Music therapy for stress reduction: a systematic review and meta-analysis. Health psychology review, 16(1), 134-159. https://doi.org/10.1080/17437199.2020.1846580	Adults	Psychosocial		Systematic review / meta-analysis				x		
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	Children	Neurological	Sensory	Qualitative study			x	x		
Feng, K., Shen, C. Y., Ma, X. Y., Chen, G. F., Zhang, M. L., Xu, B., ... & Ju, Y. (2019). Effects of music therapy on major depressive disorder: A study of prefrontal hemodynamic functions using fNIRS. Psychiatry research, 275, 86-93. doi:https://doi.org/10.1016/j.psychres.2019.03.015	Adults	Psychosocial		Pre-post (pilot study)	x			x		
Gardiner, J. C., & Horwitz, J. L. (2015). Neurologic music therapy and group psychotherapy for treatment of traumatic brain injury: Evaluation of a	Adults	Psychosocial		Pre-post (pilot study)			x	x		

cognitive rehabilitation group. Music Therapy Perspectives, miu045. doi: 10.1093/mtp/miu045										
Gardiner, J. C., & Horwitz, J. L. (2015). Neurologic music therapy and group psychotherapy for treatment of traumatic brain injury: Evaluation of a cognitive rehabilitation group. Music Therapy Perspectives, 33(2), 193–201. https://doi.org/10.1093/mtp/miu045	Adults	Cognitive		Pre-post (pilot study)				x		
Gassner, L., Geretsegger, M., & Mayer-Ferbas, J. (2021). Effectiveness of music therapy for autism spectrum disorder, dementia, depression, insomnia, and schizophrenia: Update of systematic reviews. European Journal of Public Health, 32(1), 27–34. https://doi.org/10.1093/eurpub/ckab042	Mixed ages	Psychosocial		Systematic review / meta-analysis	x		x	x	x	
Geretsegger, M., Fusar-Poli, L., Elefant, C., Mössler, K. A., Vitale, G., & Gold, C. (2022). Music therapy for autistic people. Cochrane Database of Systematic Reviews, (5). https://doi.org/10.1002/14651858.CD004381.pub4	Mixed ages	Neurological	Cognitive	Systematic review / meta-analysis				x		
Geretsegger, M., Mössler, K. A., Bieleninik, Ł., Chen, X. J., Heldal, T. O., & Gold, C. (2017). Music therapy for people with schizophrenia and schizophrenia-like disorders. Cochrane Database of Systematic Reviews, (5). https://doi.org/10.1002/14651858.CD004025.pub4	Adults	Psychosocial		Systematic review / meta-analysis				x		
Ghasemtabar, S. N., Hosseini, M., Fayyaz, I., Arab, S., Naghashian, H., & Poudineh, Z. (2015). Music therapy: An effective approach in improving social skills of children with autism. Advanced Biomedical Research, 4(1), 157–157. https://doi.org/10.4103/2277-9175.161584	Children	Psychosocial		Non-randomized controlled study			x	x		
Gold, C., Mössler, K., Grocke, D., Heldal, T. O., Tjemsland, L., Aarre, T., ... & Rolvsjord, R. (2013). Individual music therapy for mental health care clients with low therapy motivation: Multicentre randomised controlled trial. Psychotherapy and Psychosomatics, 82(5), 319-331. https://doi.org/10.1159/000348452	Adults	Psychosocial		Randomized controlled trial			x	x	x	
Gold, C., Solli, H. P., Krüger, V., & Lie, S. A. (2009). Dose–response relationship in music therapy for people with serious mental disorders: Systematic review and meta-analysis. Clinical psychology review, 29(3), 193-207. https://doi.org/10.1016/j.cpr.2009.01.001	Adults	Psychosocial		Systematic review / meta-analysis				x		

Gold, C., Voracek, M., & Wigram, T. (2004). Effects of music therapy for children and adolescents with psychopathology: A meta-analysis. Journal of Child Psychology and Psychiatry, 45(6), 1054-1063. https://doi.org/10.1111/j.1469-7610.2004.t01-1-00298.x	Adolescents	Psychosocial		Systematic review / meta-analysis				x		
Graham, J. (2004). Communication with the uncommunicative: Music therapy with pre-verbal adults. British Journal of Learning Disabilities, 32(1), 24-29. doi: 10.1111/j.1468-3156.2004.00247	Adults	Cognitive	Psychosocial	Case study	x		x	x		
Grocke, D., Bloch, S., Castle, D., Thompson, G., Newton, R., Stewart, S., & Gold, C. (2014). Group music therapy for severe mental illness: a randomized embedded-experimental mixed methods study. Acta Psychiatrica Scandinavica, 130(2), 144-153. https://doi.org/10.1111/acps.12224	Adults	Psychosocial		Randomized controlled trial				x		
Guetin, S., Soua, B., Voiriot, G., Picot, M.C., & Herisson, C. (2009). The effect of music therapy on mood and anxiety-depression: an observational study in institutionalized patients with traumatic brain injury. Annals of Physical & Rehabilitation Medicine, 52, 30-40. doi: 10.1016/j.annrmp.2008.08.009	Adults	Neurological	Psychosocial	Within-subject design				x		
Haire, C. M., Vuong, V., Tremblay, L., Patterson, K. K., Chen, J. L., & Thaut, M. H. (2021). Effects of therapeutic instrumental music performance and motor imagery on chronic post-stroke cognition and affect: A randomized controlled trial. NeuroRehabilitation, 48(2), 195-208. doi:10.3233/nre-208014	Adults	Neurological		Randomized controlled trial			x	x		
Hense, C., McFerran, K. S., & McGorry, P. (2014). Constructing a grounded theory of young people's recovery of musical identity in mental illness. The Arts in Psychotherapy, 41(5), 594–603. https://doi.org/10.1016/j.aip.2014.10.010	Young adults	Psychosocial	Cognitive	Qualitative study	x		x	x		
Hurt, C.P., Rice, R.R., McIntosh, G.C., & Thaut, M.H. (1998). Rhythmic auditory stimulation in gait training for patients with traumatic brain injury. Journal of Music Therapy, 35(4), 228-241. https://doi.org/10.1093/jmt/35.4.228	Adults	Neurological	Physical	Pre-post (pilot study)		x		x		
James, R., Sigafoos, J., Green, V. A., Lancioni, G. E., O'Reilly, M. F., Lang, R., Davis, T., Carnett, A.,	Mixed ages	Psychosocial		Systematic review /	x		x	x		

Achmadi, D., Gevarter, C., & Marschik, P. B. (2015). Music therapy for individuals with Autism Spectrum Disorder: a systematic review. Review Journal of Autism and Developmental Disorders, 2(1), 39–54. https://doi.org/10.1007/s40489-014-0035-4				meta-analysis						
Jia, R., Liang, D., Yu, J., Lu, G., Wang, Z., Wu, Z., ... & Chen, C. (2020). The effectiveness of adjunct music therapy for patients with schizophrenia: A meta-analysis. Psychiatry Research, 293, 113464. doi:10.1016/j.psychres.2020.113464	Adults	Psychosocial		Systematic review / meta-analysis				x		
Johansson, A. M., Domellöf, E., & Rönnqvist, L. (2012). Short- and long-term effects of synchronized metronome training in children with hemiplegic cerebral palsy: A two case study. Developmental Neurorehabilitation, 15(2), 160–169. https://doi.org/10.3109/17518423.2011.635608	Children	Physical		Case study				x		
Johnels, L., Vehmas, S., & Wilder, J. (2023). Musical interaction with children and young people with severe or profound intellectual and multiple disabilities: a scoping review. International Journal of Developmental Disabilities, 69(4), 487–504. https://doi.org/10.1080/20473869.2021.1959875	Children	Intellectual	Physical	Systematic review / meta-analysis	x		x	x		
Kern, P., Wolery, M., & Aldridge, D. (2007). Use of songs to promote independence in morning greeting routines for young children with autism. Journal of Autism and Developmental Disorders, 37(7), 1264–1271. https://doi.org/10.1007/s10803-006-0272-1	Infants	Intellectual	Psychosocial	Case study	x		x	x		
Knott, D. (2015). Musical Mnemonics Training: Proposed Mechanisms and Case Example with Acquired Brain Injury. Music Therapy Perspectives, miv016. doi: 10.1093/mtp/miv016	Adolescents	Neurological	Cognitive	Case study	x			x		
Knox, R., Yokota-Adachi, H., Kershner, J., & Jutai, J. (2003). Musical attention training program and alternating attention in brain injury: An initial report. Music Therapy Perspectives, 21, 99-104. doi: 10.1093/mtp/21.2.99	Adolescents	Neurological	Cognitive	Pre-post (pilot study)				x		
Kwak, E.E. (2007). Effect of rhythmic auditory stimulation on gait performance in children with spastic cerebral palsy. Journal of Music Therapy, 44(3), 198-216. https://doi.org/10.1093/jmt/44.3.198	Children	Physical	Neurological	Randomized controlled trial		x		x		

LaGasse, A. B. (2014). Effects of a music therapy group intervention on enhancing social skills in children with autism. Journal of Music Therapy, 51(3), 250–275. https://doi.org/10.1093/jmt/thu012	Children	Cognitive	Psychosocial	Randomized controlled trial	x		x	x		
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. https://doi.org/10.2147/PROM.S106267	Children	Cognitive					x	x		
Lam, H. L., Li, W. T. V., Laher, I., & Wong, R. Y. (2020). Effects of music therapy on patients with dementia—A systematic review. Geriatrics, 5(4), 62. https://doi.org/10.3390/geriatrics5040062	Older adults	Neurological		Systematic review / meta-analysis	x		x	x		
Lici, E., Avdulaj, E., Zhapaj, A., & Lamaj, P. D. I. (2024). The Effect Of Music Education On The Development Of Students With Autism Spectrum Disorders And Intellectual Disabilities: A Systematic Review Of The Literature. Educational Administration: Theory and Practice, 30(5), 2229-2238. https://kuey.net/index.php/kuey/article/view/3269/2083	Adolescents	Intellectual	Neurological	Systematic review / meta-analysis	x		x	x		
Liu, Q., Li, W., Yin, Y., Zhao, Z., Yang, Y., Zhao, Y., ... & Yu, J. (2022). The effect of music therapy on language recovery in patients with aphasia after stroke: a systematic review and meta-analysis. Neurological Sciences, 1-10. doi:10.1007/s10072-021-05743-9	Older adults	Neurological		Systematic review / meta-analysis	x			x		
Lopes, J., & Keppers, I. I. (2021). Music-based therapy in rehabilitation of people with multiple sclerosis: a systematic review of clinical trials. Arquivos de Neuro-Psiquiatria, 79(6), 527-535. http://dx.doi.org/10.1590/0004-282X-ANP-2020-0374	Adults	Neurological	Physical	Systematic review / meta-analysis		x		x		
Lu, G., Jia, R., Liang, D., Yu, J., Wu, Z., & Chen, C. (2021). Effects of music therapy on anxiety: A meta-analysis of randomized controlled trials. Psychiatry Research, 304, 114137. https://doi.org/10.1016/j.psychres.2021.114137	Mixed ages	Psychosocial		Systematic review / meta-analysis				x		
Ma, Y., Nagler, J., Lee, M., & Cabrera, I. (2001). Impact of music therapy on the communication skills of toddlers with pervasive developmental disorder. Annals of the New York Academy of Sciences, 930, 445-447. doi: 10.1111/j.1749-6632.2001.tb05766.x	Children	Cognitive		Case study	x		x	x		

Machado Sotomayor, M. J., Arufe-Giráldez, V., Ruíz-Rico, G., & Navarro-Patón, R. (2021). Music therapy and Parkinson's disease: A systematic review from 2015–2020. International Journal of Environmental Research and Public Health, 18(21), 11618. https://doi.org/10.3390/ijerph182111618	Adults	Neurological		Systematic review / meta-analysis	x	x		x		
Magee, W. L., & Davidson, J. W. (2002). The effect of music therapy on mood states in neurological patients: a pilot study. Journal of music therapy, 39(1), 20-29.	Adults	Neurological		Pre-post (pilot study)				x		
Magee, W. L., Baker, F., Daveson, B., et al. (2011). Music therapy methods with children, adolescents, and adults with severe neurobehavioral disorders due to brain injury. Music Therapy Perspectives, 29(1), 5–13. https://doi.org/10.1093/mtp/29.1.5	Children	Neurological	Psychosocial	Case study	x		x	x		
Magee, W. L., Clark, I., Tamplin, J., & Bradt, J. (2017). Music interventions for acquired brain injury. Cochrane Database of Systematic Reviews. https://doi.org/10.1002/14651858.CD006787.pub3	Adults	Physical	Cognitive	Systematic review / meta-analysis	x	x		x		
Marquez-Garcia, A. V., Magnuson, J., Morris, J., Iarocci, G., Doesburg, S., & Moreno, S. (2022). Music therapy in Autism Spectrum Disorder: a systematic review. Review Journal of Autism and Developmental Disorders, 9(1), 91–107. https://doi.org/10.1007/s40489-021-00246-x	Mixed ages	Psychosocial	Sensory	Systematic review / meta-analysis	x		x	x		
Martínez-Molina, N., Siponkoski, S.-T., & Särkämö, T. (2022). Cognitive efficacy and neural mechanisms of music-based neurological rehabilitation for traumatic brain injury. Annals of the New York Academy of Sciences, 1515(1), 20–32. https://doi.org/10.1111/nyas.14800	Adults	Cognitive	Neurological	Randomized controlled trial				x		
Mateos-Moreno, D., & Atencia-Doña, L. (2013). Effect of a combined dance/movement and music therapy on young adults diagnosed with severe autism. The Arts in Psychotherapy, 40(5), 465–472. https://doi.org/10.1016/j.aip.2013.09.004	Young adults	Psychosocial		Non-randomized controlled study				x		
McDermott, O., Crellin, N., Ridder, H. M., & Orrell, M. (2013). Music therapy in dementia: a narrative synthesis systematic review. International journal of geriatric psychiatry, 28(8), 781-794.	Older adults	Neurological		Systematic review / meta-analysis			x	x		
Mishra, R., Florez-Perdomo, W. A., Shrivatava, A., Chouksey, P., Raj, S., Moscote-Salazar, L. R., ... & Agrawal, A. (2021). Role of music therapy in	Adults	Physical	Cognitive	Systematic review /		x		x		

traumatic brain injury: A systematic review and meta-analysis. World neurosurgery, 146, 197-204. https://doi.org/10.1016/j.wneu.2020.10.130				meta-analysis						
Moore, K.S., Peterson, D.A., O'Shea, G., McIntosh, G.C., & Thaut, M.H. (2008). The effectiveness of music as a mnemonic device on recognition memory for people with multiple sclerosis. Journal of Music Therapy, 45, 307-329. doi: 10.1093/jmt/45.3.307	Adults	Cognitive		Randomized controlled trial	x			x		
Park, J. I., Lee, I. H., Lee, S. J., Kwon, R. W., Choo, E. A., Nam, H. W., & Lee, J. B. (2023). Effects of music therapy as an alternative treatment on depression in children and adolescents with ADHD by activating serotonin and improving stress coping ability. BMC complementary medicine and therapies, 23(1), 73. https://doi.org/10.1186/s12906-022-03832-6	Adolescents	Neurological	Psychosocial	Randomized controlled trial				x		
Pasiali, V., LaGasse, A. B., & Penn, S. L. (2014). The effect of musical attention control training (MACT) on attention skills of adolescents with neurodevelopmental delays: A pilot study. Journal of music therapy, 51(4), 333-354. doi:10.1093/jmt/thu030	Children	Sensory		Pre-post (pilot study)				x		
Pavlicevic, M., O'Neil, N., Powell, H., Jones, O., & Sampathianaki, E. (2014). Making music, making friends: Long-term music therapy with young adults with severe learning disabilities. Journal of intellectual disabilities, 18(1), 5-19. doi:10.1177/1744629513511354	Young adults	Intellectual	Psychosocial	Qualitative study			x	x	x	
Rabeyron, T., Robledo Del Canto, J. P., Carasco, E., & et al. (2020). A randomized controlled trial of 25 sessions comparing music therapy and music listening for children with autism spectrum disorder. Psychiatry Research, 293, 113377. https://doi.org/10.1016/j.psychres.2020.113377	Children	Psychosocial	Cognitive	Randomized controlled trial	x		x	x		
Raghavan, P., Geller, D., Guerrero, N., Aluru, V., Eimicke, J. P., Teresi, J. A., ... & Turry, A. (2016). Music upper limb therapy—integrated: an enriched collaborative approach for stroke rehabilitation. Frontiers in Human Neuroscience, 10, 498. doi:10.3389/fnhum.2016.00498	Adults	Intellectual		Non-randomized controlled study		x		x		
Sharda, M., Tuerk, C., Chowdhury, R., Jamey, K., Foster, N., Custo-Blanch, M., ... & Hyde, K. (2018). Music improves social communication and auditory–motor connectivity in children with autism.	Children	Sensory	Psychosocial	Randomized controlled trial	x		x	x		

Translational psychiatry, 8(1), 231. doi:10.1038/s41398-018-0287-3										
Shi, Z. M., Lin, G. H., & Xie, Q. (2016). Effects of music therapy on mood, language, behavior, and social skills in children with autism: A meta-analysis. Chinese Nursing Research, 3(3), 137-141. https://doi.org/10.1016/j.cnre.2016.06.018	Children	Sensory		Systematic review / meta-analysis	x		x	x		
Sihvonen, A. J., Siponkoski, S.-T., Martinez-Molina, N., Laitinen, S., Holma, M., Ahlfors, M., Kuusela, L., Pekkola, J., Koskinen, S., & Sarkamo, T. (2022). Neurological Music Therapy Rebuilds Structural Connectome after Traumatic Brain Injury: Secondary Analysis from a Randomized Controlled Trial. JOURNAL OF CLINICAL MEDICINE, 11(8), 2184. https://doi.org/10.3390/jcm11082184	Adults	Cognitive		Randomized controlled trial				x		
Silverman, M. J. (2007). The effect of paired pitch, rhythm, and speech on working memory as measured by sequential digit recall. Journal of Music Therapy, 44(4), 415-427. https://doi.org.au/10.1093/jmt/44.4.415	Adults	Cognitive		Within-subject design				x		
Simpson, K., & Keen, D. (2011). Music interventions for children with autism: Narrative review of the literature. Journal of autism and developmental disorders, 41, 1507-1514. https://doi.org/10.1007/s10803-010-1172-y	Children	Neurological		Systematic review / meta-analysis	x		x	x		
Siponkoski, S. T., Martínez-Molina, N., Kuusela, L., Laitinen, S., Holma, M., Ahlfors, M., ... & Särkämö, T. (2020). Music therapy enhances executive functions and prefrontal structural neuroplasticity after traumatic brain injury: evidence from a randomized controlled trial. Journal of neurotrauma, 37(4), 618-634. doi:10.1089/neu.2019.6413	Adults	Neurological		Randomized controlled trial				x		
Spiro, N., Tsiris, G., & Cripps, C. (2018). A systematic review of outcome measures in music therapy. Music Therapy Perspectives, 36(1), 67–78. https://doi.org/10.1093/mtp/mix011	Mixed ages			Systematic review / meta-analysis	x		x	x		
Tan, M., Friyia, S., Hurt-Thaut, C., Rizvi, S. J., & Thaut, M. H. (2025). Music-based cognitive training for adults with major depressive disorder and suicide risk: A pilot study. Journal of Clinical Medicine, 14(3), 757. https://doi.org/10.3390/jcm14030757	Adults	Cognitive	Psychosocial	Pre-post (pilot study)				x		

Thaut, M. H., Gardiner, J. C., Holmberg, D., Horwitz, J., Kent, L., Andrews, G., ... & McIntosh, G. R. (2009). Neurologic music therapy improves executive function and emotional adjustment in traumatic brain injury rehabilitation. Annals of the New York Academy of Sciences, 1169(1), 406-416. https://doi.org.au/10.1111/j.1749-6632.2009.04585.x	Adults	Neurological	Psychosocial	Pre-post (pilot study)				x		
Thompson, G. (2017). 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	Children	Neurological	Intellectual	Qualitative study	x			x		
Thompson, Z., & Khalil-Salib, L. (2021). Online music therapy groups during COVID-19: Perspectives from NDIS participants and caregivers. Australian Journal of Music Therapy, 32(1), 53–63.	Adults	Cognitive	Intellectual	Mixed methods	x		x	x	x	
Tseng, P. T., Chen, Y. W., Lin, P. Y., et al. (2016). Significant treatment effect of adjunct music therapy to standard treatment on the positive, negative, and mood symptoms of schizophrenic patients: A meta-analysis. BMC Psychiatry, 16, 16. https://doi.org/10.1186/s12888-016-0718-8	Adults	Psychosocial	Cognitive	Systematic review / meta-analysis	x		x	x		
Tsirigoti, A., & Georgiadi, M. (2024). The efficacy of music therapy programs on the development of social communication in children with Autism Spectrum Disorder: A systematic review. Education Sciences, 14(4), 373. https://doi.org/10.3390/educsci14040373	Children	Psychosocial		Systematic review / meta-analysis			x	x		
Twyford, K., Taylor, S., Valentine, J., Pool, J., Baron, A., & Thornton, A. (2024). Functional outcomes in children and adolescents with neurodisability accessing music therapy: A scoping review. Developmental Medicine and Child Neurology. https://doi.org/10.1111/dmcn.16135	Adolescents	Physical	Cognitive	Systematic review / meta-analysis	x	x		x		
Weller, C. M., & Baker, F. A. (2011). The role of music therapy in physical rehabilitation: a systematic literature review. Nordic Journal of Music Therapy, 20(1), 43-61. doi:10.1080/08098131.2010.485785	Mixed ages	Physical		Systematic review / meta-analysis		x		x		
Wheeler, B. L., Shiflett, S. C., & Nayak, S. (2003). Effects of number of sessions and group or individual music therapy on mood and behavior of	Adults	Neurological	Psychosocial	Non-randomized		x	x	x		

people with stroke or traumatic brain injuries. Nordic Journal of Music Therapy, 12(2), 139-151. https://doi.org/10.1080/08098130309478084				controlled study						
Whipple, J. (2004). Music in intervention for children and adolescents with autism: A meta-analysis. Journal of music therapy, 41(2), 90-106. https://doi.org/10.1093/jmt/41.2.90	Children	Neurological		Systematic review / meta-analysis	x		x	x		
Windle, E., Hickling, L. M., Jayacodi, S., & Carr, C. (2020). The experiences of patients in the synchrony group music therapy trial for long-term depression. The Arts in Psychotherapy, 67, Article 101580. https://doi.org/10.1016/j.aip.2019.101580	Adults	Psychosocial	Psychosocial	Qualitative study	x			x	x	
Wolfe, D.E. & Noguchi, L.K. (2009). The use of music with young children to improve sustained attention during a vigilance task in the presence of auditory distractions. Journal of Music Therapy, 46, 69-83. https://doi.org.au/10.1093/jmt/46.1.69	Children	Cognitive	Sensory	Within-subject design				x		
Yanagiwara, S., Yasuda, T., Koike, M., Okamoto, T., Ushida, K., & Momosaki, R. (2022). Effects of music therapy on functional ability in people with cerebral palsy: a systematic review. Journal of Rural Medicine, 17(3), 101-107. doi:10.2185/jrm.2022-014	Children	Neurological		Systematic review / meta-analysis		x		x		
Yoo, G.E., & Kim, S.J. (2016). Rhythmic auditory cueing in motor rehabilitation for stroke patients: Systematic review and meta-analysis. Journal of Music Therapy, 53(2), 149–177. https://doi.org/10.1093/jmt/thw003	Older adults	Neurological	Physical	Systematic review / meta-analysis		x		x		
Zhang, Y., Cai, J., An, L., et al. (2017). Does music therapy enhance behavioral and cognitive function in elderly dementia patients? A systematic review and meta-analysis. Ageing Research Reviews, 35, 1–11. https://doi.org/10.1016/j.arr.2016.12.003	Older adults	Neurological		Systematic review / meta-analysis			x	x		

Appendix 4

Language and communication citations

Citations: LANGUAGE & COMMUNICATION	Participant age group	Impairment (primary)	Impairment (secondary)	Research design	language & communication	mobility & movement	interpersonal interactions	functioning (inc. psychosocial functioning)	community living	personal care
Applewhite, B., Cankaya, Z., Heiderscheit, A., & Himmerich, H. (2022). A systematic review of scientific studies on the effects of music in people with or at risk for autism spectrum disorder. *International Journal of Environmental Research and Public Health, 19*(9), 5150. https://doi.org/10.3390/ijerph19095150				Systematic review / meta-analysis	x		x	x		
Bharathi, G., Jayaramayya, K., Balasubramanian, V., & Vellingiri, B. (2019). The potential role of rhythmic entrainment and music therapy intervention for individuals with autism spectrum disorders. Journal of exercise rehabilitation, 15(2), 180–186. doi:10.12965/jer.1836578.289	Children	Neurological	Psychosocial	Systematic review / meta-analysis	x	x		x	x	
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. doi:10.1093/jmt/thaa015		Sensory	Physical	Systematic review / meta-analysis	x		x			
Bower, J., Catroppa, C., Grocke, D., & Shoemark, H. (2014). Music therapy for early cognitive rehabilitation post-childhood TBI: An intrinsic mixed methods case study. Developmental Neurorehabilitation, 17(5), 339–346. https://doi.org/10.3109/17518423.2013.778910	Children	Cognitive	Physical	Mixed methods	x	x	x	x		

Burns, J., Healy, H., O'Connor, R., Moss, H., Sena Moore, K., & Jacobsen, S. L. (2024). Integrative Review of Music and Music Therapy Interventions on Functional Outcomes in Children with Acquired Brain Injury. The Journal of Music Therapy. https://doi.org/10.1093/jmt/thae017	Children	Cognitive	Neurological	Systematic review / meta-analysis	x	x				
Chou, M. Y., Chang, N. W., Chen, C., Lee, W. T., Hsin, Y. J., Siu, K. K., ... & Hung, P. L. (2019). The effectiveness of music therapy for individuals with Rett syndrome and their families. Journal of the Formosan Medical Association, 118(12), 1633-1643. doi:10.1016/j.jfma.2019.01.001	Children	Intellectual		Randomized controlled trial	x	x	x			
Fan, Q., Ding, M., Cheng, W., Su, L., Zhang, Y., Liu, Q., & Wu, Z. (2024). The clinical effects of Orff music therapy on children with autism spectrum disorder: a comprehensive evaluation. Frontiers in Neurology, 15, 1387060-. https://doi.org/10.3389/fneur.2024.1387060	Infants	Cognitive	Psychosocial	Non-randomized controlled study	x	x	x			
Feng, K., Shen, C. Y., Ma, X. Y., Chen, G. F., Zhang, M. L., Xu, B., ... & Ju, Y. (2019). Effects of music therapy on major depressive disorder: A study of prefrontal hemodynamic functions using fNIRS. Psychiatry research, 275, 86-93. doi:https://doi.org/10.1016/j.psychres.2019.03.015	Adults	Psychosocial		Pre-post (pilot study)	x			x		
Gassner, L., Geretsegger, M., & Mayer-Ferbas, J. (2021). Effectiveness of music therapy for autism spectrum disorder, dementia, depression, insomnia, and schizophrenia: Update of systematic reviews. *European Journal of Public Health, 32*(1), 27–34. https://doi.org/10.1093/eurpub/ckab042				Systematic review / meta-analysis	x		x	x	x	
Gattino, G. S., Riesgo, R. dos S., Longo, D., Leite, J. C. L., & Faccini, L. S. (2011). Effects of relational music therapy on communication of children with autism: a randomized controlled study. *Nordic Journal of Music Therapy*, *20*(2), 142–154. https://doi.org/10.1080/08098131.2011.566933	Children	Psychosocial		Randomized controlled trial	x					

Graham, J. (2004). Communication with the uncommunicative: Music therapy with pre-verbal adults. British Journal of Learning Disabilities, 32(1), 24-29. doi: 10.1111/j.1468-3156.2004.00247	Adults	Cognitive	Psychosocial	Case study	x		x	x		
Groß W, Linden U, Ostermann T. (2010). Effects of music therapy in the treatment of children with delayed speech development - results of a pilot study. BMC Complementary and Alternative Medicine. 10(1),39. doi: 10.1186/1472-6882-10-39	Children	Cognitive		Within-subject design	x					
Hakvoort, L., Bogaerts, S., Thaut, M. H., & Spreen, M. (2015). Influence of music therapy on coping skills and anger management in forensic psychiatric patients: An exploratory study. *International Journal of Offender Therapy and Comparative Criminology, 59*(8), 810–836. https://doi.org/10.1177/0306624x13516787	Adults	Psychosocial	Cognitive	Randomized controlled trial	x		x			
Hense, C., McFerran, K. S., & McGorry, P. (2014). Constructing a grounded theory of young people's recovery of musical identity in mental illness. *The Arts in Psychotherapy, 41*(5), 594–603. https://doi.org/10.1016/j.aip.2014.10.010	Young adults	Psychosocial	Cognitive	Qualitative study	x		x	x		
Hurkmans, J., Jonkers, R., de Bruijn, M., Boonstra, A. M., Hartman, P. P., Arendzen, H., & Reinders-Messelink, H. A. (2015). The effectiveness of Speech–Music Therapy for Aphasia (SMTA) in five speakers with Apraxia of Speech and aphasia. Aphasiology, 29(8), 939-964. doi:10.1080/02687038.2015.1006565	Mixed ages	Neurological			x					
James, R., Sigafoos, J., Green, V. A., Lancioni, G. E., O'Reilly, M. F., Lang, R., Davis, T., Carnett, A., Achmadi, D., Gevarter, C., & Marschik, P. B. (2015). Music therapy for individuals with Autism Spectrum Disorder: a systematic review. Review Journal of Autism and Developmental Disorders, 2(1), 39–54. https://doi.org/10.1007/s40489-014-0035-4	Mixed ages	Psychosocial		Systematic review / meta-analysis	x		x	x		

Johnels, L., Vehmas, S., & Wilder, J. (2023). Musical interaction with children and young people with severe or profound intellectual and multiple disabilities: a scoping review. *International Journal of Developmental Disabilities*, *69*(4), 487–504. https://doi.org/10.1080/20473869.2021.1959875	Children	Intellectual	Physical	Systematic review / meta-analysis	x		x	x		
Kern, P., Wolery, M., & Aldridge, D. (2007). Use of songs to promote independence in morning greeting routines for young children with autism. *Journal of Autism and Developmental Disorders, 37*(7), 1264–1271. https://doi.org/10.1007/s10803-006-0272-1	Infants	Intellectual	Psychosocial	Case study	x		x	x		
Knott, D. (2015). Musical Mnemonics Training: Proposed Mechanisms and Case Example with Acquired Brain Injury. Music Therapy Perspectives, miv016. doi: 10.1093/mtp/miv016	Adolescents	Neurological	Cognitive	Case study	x			x		
LaGasse, A. B. (2014). Effects of a music therapy group intervention on enhancing social skills in children with autism. Journal of Music Therapy, 51(3), 250–275. https://doi.org/10.1093/jmt/thu012	Children	Cognitive	Psychosocial	Randomized controlled trial	x		x	x		
Lee, J.- young, & McFerran, K. (2012). The Improvement of Non-Verbal Communication Skills of Five Females with Profound and Multiple Disabilities Using Song-Choices in Music Therapy. Voices: A World Forum for Music Therapy, 12(3). https://doi.org/10.15845/voices.v12i3.644	Adults	Physical	Intellectual	Pre-post (pilot study)	x		x			
Lici, E., Avdulaj, E., Zhapaj, A., & Lamaj, P. D. I. (2024). The Effect Of Music Education On The Development Of Students With Autism Spectrum Disorders And Intellectual Disabilities: A Systematic Review Of The Literature. Educational Administration: Theory and Practice, 30(5), 2229-2238. https://kuey.net/index.php/kuey/article/view/3269/2083	Adolescents	Intellectual	Neurological	Systematic review / meta-analysis	x		x	x		

Lim, H. A., & Draper, E. (2011). The effects of music therapy incorporated with applied behavior analysis verbal behavior approach for children with Autism Spectrum Disorders. *The Journal of Music Therapy*, *48*(4), 532–550. https://doi.org/10.1093/jmt/48.4.532	Children	Cognitive	Psychosocial	Randomized controlled trial	x					
Lim, K. B., Kim, Y. K., Lee, H. J., Yoo, J., Hwang, J. Y., Kim, J. A., & Kim, S. K. (2013). The therapeutic effect of neurologic music therapy and speech language therapy in post-stroke aphasic patients. Annals of rehabilitation medicine, 37(4), 556-562. doi:10.5535/arm.2013.37.4.556	Older adults	Neurological		Randomized controlled trial	x					
Liu, Q., Li, W., Yin, Y., Zhao, Z., Yang, Y., Zhao, Y., ... & Yu, J. (2022). The effect of music therapy on language recovery in patients with aphasia after stroke: a systematic review and meta-analysis. Neurological Sciences, 1-10. doi:10.1007/s10072-021-05743-9	Older adults	Neurological		Systematic review / meta-analysis	x			x		
Ma, Y., Nagler, J., Lee, M., & Cabrera, I. (2001). Impact of music therapy on the communication skills of toddlers with pervasive developmental disorder. Annals of the New York Academy of Sciences, 930, 445-447. doi: 10.1111/j.1749-6632.2001.tb05766.x	Children	Cognitive		Case study	x		x	x		
Machado Sotomayor, M. J., Arufe-Giráldez, V., Ruíz-Rico, G., & Navarro-Patón, R. (2021). Music therapy and Parkinson's disease: A systematic review from 2015–2020. International Journal of Environmental Research and Public Health, 18(21), 11618. https://doi.org/10.3390/ijerph182111618	Adults	Neurological		Systematic review / meta-analysis	x	x		x		
Magee, W. L., Baker, F., Daveson, B., et al. (2011). Music therapy methods with children, adolescents, and adults with severe neurobehavioral disorders due to brain injury. *Music Therapy Perspectives, 29*(1), 5–13. https://doi.org/10.1093/mtp/29.1.5	Children	Neurological	Psychosocial	Case study	x		x	x		
Magee, W. L., Clark, I., Tamplin, J., & Bradt, J. (2017). Music interventions for acquired brain injury. Cochrane Database of Systematic Reviews. https://doi.org/10.1002/14651858.CD006787.pub3	Adults	Physical	Cognitive	Systematic review / meta-analysis	x	x		x		

Marquez-Garcia, A. V., Magnuson, J., Morris, J., Iarocci, G., Doesburg, S., & Moreno, S. (2022). Music therapy in Autism Spectrum Disorder: a systematic review. Review Journal of Autism and Developmental Disorders, 9(1), 91–107. https://doi.org/10.1007/s40489-021-00246-x	Mixed ages	Psychosocial	Sensory	Systematic review / meta-analysis	x		x	x		
Moore, K.S., Peterson, D.A., O'Shea, G., McIntosh, G.C., & Thaut, M.H. (2008). The effectiveness of music as a mnemonic device on recognition memory for people with multiple sclerosis. Journal of Music Therapy, 45, 307-329. doi: 10.1093/jmt/45.3.307	Adults	Cognitive		Randomized controlled trial	x			x		
Rabeyron, T., Robledo Del Canto, J. P., Carasco, E., & et al. (2020). A randomized controlled trial of 25 sessions comparing music therapy and music listening for children with autism spectrum disorder. *Psychiatry Research, 293*, 113377. https://doi.org/10.1016/j.psychres.2020.113377	Children	Psychosocial	Cognitive	Randomized controlled trial	x		x	x		
Raglio, A., Oasi, O., Gianotti, M., Rossi, A., Goulene, K., & Stramba-Badiale, M. (2016). Improvement of spontaneous language in stroke patients with chronic aphasia treated with music therapy: a randomized controlled trial. International Journal of Neuroscience, 126(3), 235-242. doi:10.3109/00207454.2015.1010647	Older adults	Neurological		Randomized controlled trial	x					
Salomon-Gimmon, M., & Elefant, C. (2019). Development of vocal communication in children with autism spectrum disorder during improvisational music therapy. Nordic Journal of Music Therapy, 28(3), 174-192. doi:10.1080/08098131.2018.1529698	Children	Sensory	Psychosocial	Case study	x					
Senkal, O.A., & Muhtar, Z. (2021). Role of orff music therapy in improving auditory processing skills in children with intellectual disability. Nigerian Journal of Clinical Practice, 25(7), 1005-1014. Retrieved from https://scholar.google.com/citations?view_op=view_citation&hl=en&user=2Ff8TyIAAAAJ&citation_for_view=2Ff8TyIAAAAJ:Zph67rFs4hoC	Adolescents	Intellectual		Randomized controlled trial	x					

Sharda, M., Tuerk, C., Chowdhury, R., Jamey, K., Foster, N., Custo-Blanch, M., ... & Hyde, K. (2018). Music improves social communication and auditory–motor connectivity in children with autism. Translational psychiatry, 8(1), 231. doi:10.1038/s41398-018-0287-3	Children	Sensory	Psychosocial	Randomized controlled trial	x		x	x		
Shi, Z. M., Lin, G. H., & Xie, Q. (2016). Effects of music therapy on mood, language, behavior, and social skills in children with autism: A meta-analysis. Chinese Nursing Research, 3(3), 137-141. https://doi.org/10.1016/j.cnre.2016.06.018	Children	Sensory		Systematic review / meta-analysis	x		x	x		
Simpson, K., & Keen, D. (2011). Music interventions for children with autism: Narrative review of the literature. Journal of autism and developmental disorders, 41, 1507-1514. https://doi.org/10.1007/s10803-010-1172-y	Children	Neurological		Systematic review / meta-analysis	x		x	x		
Spiro, N., Tsiris, G., & Cripps, C. (2018). A systematic review of outcome measures in music therapy. Music Therapy Perspectives, 36(1), 67–78. https://doi.org/10.1093/mtp/mix011				Systematic review / meta-analysis	x		x	x		
Thompson, G. (2017). 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	Children	Neurological	Intellectual	Qualitative study	x			x		
Thompson, G., & McFerran, K. (2015). Music therapy with young people who have profound intellectual and developmental disability: Four case studies exploring communication and engagement within musical interactions. Journal of Intellectual and Developmental Disabilities, 40(1), 1-11. https://doi.org/10.3109/13668250.2014.965668	Adolescents	Physical	Intellectual	Pre-post (pilot study)	x		x			
Thompson, Z., & Khalil-Salib, L. (2021). Online music therapy groups during COVID-19: Perspectives from NDIS participants and caregivers. *Australian Journal of Music Therapy, 32*(1), 53–63.	Adults	Cognitive	Intellectual	Mixed methods	x		x	x	x	

Tseng, P. T., Chen, Y. W., Lin, P. Y., et al. (2016). Significant treatment effect of adjunct music therapy to standard treatment on the positive, negative, and mood symptoms of schizophrenic patients: A meta-analysis. *BMC Psychiatry, 16*, 16. https://doi.org/10.1186/s12888-016-0718-8	Adults	Psychosocial	Cognitive	Systematic review / meta-analysis	x		x	x		
Twyford, K., Taylor, S., Valentine, J., Pool, J., Baron, A., & Thornton, A. (2024). Functional outcomes in children and adolescents with neurodisability accessing music therapy: A scoping review. Developmental Medicine and Child Neurology. https://doi.org/10.1111/dmcn.16135	Adolescents	Physical	Cognitive	Systematic review / meta-analysis	x	x		x		
Vaiouli, P., & Andreou, G. (2018). Communication and language development of young children with autism: A review of research in music. Communication Disorders Quarterly, 39(2), 323-329. doi:10.1177/1525740117705117	Children	Sensory	Psychosocial	Pre-post (pilot study)	x					
Whipple, J. (2004). Music in intervention for children and adolescents with autism: A meta-analysis. Journal of music therapy, 41(2), 90-106. https://doi.org/10.1093/jmt/41.2.90	Children	Neurological		Systematic review / meta-analysis	x		x	x		
Windle, E., Hickling, L. M., Jayacodi, S., & Carr, C. (2020). The experiences of patients in the synchrony group music therapy trial for long-term depression. *The Arts in Psychotherapy, 67*, Article 101580. https://doi.org/10.1016/j.aip.2019.101580	Adults		Psychosocial	Qualitative study	x		x	x	x	
Yasuhara, A., Sugiyama, Y. (2001). Music therapy for children with Rett Syndrome. Brain and Development, 23, (1), S82-84. doi: 10.1016/s0387-7604(01)00336-9	Children	Neurological	Cognitive	Case study	x	x	x			
Yoo, G. E., & Kim, S. J. (2018). Dyadic drum playing and social skills: Implications for rhythm-mediated intervention for children with Autism Spectrum Disorder. *The Journal of Music Therapy*, *55*(3), 340–375. https://doi.org/10.1093/jmt/thy013	Children	Psychosocial		Mixed methods	x		x			

Appendix 5

Interpersonal Interactions

Citations: INTERPERSONAL INTERACTIONS	Participant age group	Impairment (primary)	Impairment (secondary)	Research design	language & communication	mobility & movement	interpersonal interactions	functioning (inc. psychosocial functioning)	community living	personal care
Bharathi, G., Jayaramayya, K., Balasubramanian, V., & Vellingiri, B. (2019). The potential role of rhythmic entrainment and music therapy intervention for individuals with autism spectrum disorders. Journal of exercise rehabilitation, 15(2), 180–186. doi:10.12965/jer.1836578.289	Children	Neurological	Psychosocial	Systematic review / meta-analysis	x	x	x	x	x	
Bieleninik, Ł., Geretsegger, M., Mössler, K., Assmus, J., Thompson, G., Gattino, G., . . . Muratori, F. (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	Children	Neurological	Intellectual	Randomized controlled trial			x			
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. doi:10.1093/jmt/thaa015		Sensory	Physical	Systematic review / meta-analysis	x		x			
Bower, J., Catroppa, C., Grocke, D., & Shoemark, H. (2014). Music therapy for early cognitive rehabilitation post-childhood TBI: An intrinsic mixed methods case study. Developmental Neurorehabilitation, 17(5), 339–346. https://doi.org/10.3109/17518423.2013.778910	Children	Cognitive	Physical	Mixed methods	x	x	x	x		
Carpente, J. A. (2017). Investigating the Effectiveness of a Developmental, Individual Difference, Relationship-Based (DIR) Improvisational Music Therapy Program on Social Communication for Children with Autism Spectrum	Children	Psychosocial		Pre-post (pilot study)			x	x		

Disorder. Music Therapy Perspectives. https://doi.org/10.1093/mtp/miw013										
Chou, M. Y., Chang, N. W., Chen, C., Lee, W. T., Hsin, Y. J., Siu, K. K., ... & Hung, P. L. (2019). The effectiveness of music therapy for individuals with Rett syndrome and their families. Journal of the Formosan Medical Association, 118(12), 1633-1643. doi:10.1016/j.jfma.2019.01.001	Children	Intellectual		Randomized controlled trial	x	x	x			
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	Children	Neurological	Sensory	Qualitative study			x	x		
Fan, Q., Ding, M., Cheng, W., Su, L., Zhang, Y., Liu, Q., & Wu, Z. (2024). The clinical effects of Orff music therapy on children with autism spectrum disorder: a comprehensive evaluation. Frontiers in Neurology, 15, 1387060-. https://doi.org/10.3389/fneur.2024.1387060	Infants	Cognitive	Psychosocial	Non-randomized controlled study	x	x	x			
Gardiner, J. C., & Horwitz, J. L. (2015). Neurologic music therapy and group psychotherapy for treatment of traumatic brain injury: Evaluation of a cognitive rehabilitation group. Music Therapy Perspectives, miu045. doi: 10.1093/mtp/miu045	Adults	Psychosocial		Pre-post (pilot study)			x	x		
Gassner, L., Geretsegger, M., & Mayer-Ferbas, J. (2021). Effectiveness of music therapy for autism spectrum disorder, dementia, depression, insomnia, and schizophrenia: Update of systematic reviews. European Journal of Public Health, 32(1), 27–34. https://doi.org/10.1093/eurpub/ckab042	Mixed ages	Psychosocial		Systematic review / meta-analysis	x		x	x	x	
Ghasemtabar, S. N., Hosseini, M., Fayyaz, I., Arab, S., Naghashian, H., & Poudineh, Z. (2015). Music therapy: An effective approach in improving social skills of children with autism. Advanced Biomedical Research, 4(1), 157–157. https://doi.org/10.4103/2277-9175.161584	Children	Psychosocial		Non-randomized controlled study			x	x		
Gold, C., Mössler, K., Grocke, D., Heldal, T. O., Tjemsland, L., Aarre, T., ... & Rolvsjord, R. (2013). Individual music therapy for mental health care clients with low therapy motivation: Multicentre randomised controlled trial. Psychotherapy and	Adults	Psychosocial		Randomized controlled trial			x	x	x	

Psychosomatics, 82(5), 319-331. https://doi.org/10.1159/000348452										
Graham, J. (2004). Communication with the uncommunicative: Music therapy with pre-verbal adults. British Journal of Learning Disabilities, 32(1), 24-29. doi: 10.1111/j.1468-3156.2004.00247	Adults	Cognitive	Psychosocial	Case study	x		x	x		
Haire, C. M., Vuong, V., Tremblay, L., Patterson, K. K., Chen, J. L., & Thaut, M. H. (2021). Effects of therapeutic instrumental music performance and motor imagery on chronic post-stroke cognition and affect: A randomized controlled trial. NeuroRehabilitation, 48(2), 195-208. doi:10.3233/nre-208014	Adults	Neurological		Randomized controlled trial			x	x		
Hakvoort, L., Bogaerts, S., Thaut, M. H., & Spreen, M. (2015). Influence of music therapy on coping skills and anger management in forensic psychiatric patients: An exploratory study. International Journal of Offender Therapy and Comparative Criminology, 59(8), 810–836. https://doi.org/10.1177/0306624x13516787	Adults	Psychosocial	Cognitive	Randomized controlled trial	x		x			
Hense, C., McFerran, K. S., & McGorry, P. (2014). Constructing a grounded theory of young people's recovery of musical identity in mental illness. The Arts in Psychotherapy, 41(5), 594–603. https://doi.org/10.1016/j.aip.2014.10.010	Young adults	Psychosocial	Cognitive	Qualitative study	x		x	x		
Huang, C., & Gu, S. (2024). Effectiveness of music therapy in enhancing empathy and emotional recognition in adolescents with intellectual disabilities. Acta Psychologica, 243, 104152–104152. https://doi.org/10.1016/j.actpsy.2024.104152	Adolescents	Psychosocial		Randomized controlled trial			x			
James, R., Sigafoos, J., Green, V. A., Lancioni, G. E., O'Reilly, M. F., Lang, R., Davis, T., Carnett, A., Achmadi, D., Gevarter, C., & Marschik, P. B. (2015). Music therapy for individuals with Autism Spectrum Disorder: a systematic review. Review Journal of Autism and Developmental Disorders, 2(1), 39–54. https://doi.org/10.1007/s40489-014-0035-4	Mixed ages	Psychosocial		Systematic review / meta-analysis	x		x	x		

Johnels, L., Vehmas, S., & Wilder, J. (2023). Musical interaction with children and young people with severe or profound intellectual and multiple disabilities: a scoping review. International Journal of Developmental Disabilities, 69(4), 487–504. https://doi.org/10.1080/20473869.2021.1959875	Children	Intellectual	Physical	Systematic review / meta-analysis	x		x	x		
Ke, X., Song, W., Yang, M., Li, J., & Liu, W. (2022). Effectiveness of music therapy in children with autism spectrum disorder: A systematic review and meta-analysis. Frontiers in Psychiatry, 13, 905113. https://doi.org/10.3389/fpsyt.2022.905113	Children	Neurological		Systematic review / meta-analysis			x			
Kern, P., Wolery, M., & Aldridge, D. (2007). Use of songs to promote independence in morning greeting routines for young children with autism. Journal of Autism and Developmental Disorders, 37(7), 1264–1271. https://doi.org/10.1007/s10803-006-0272-1	Infants	Intellectual	Psychosocial	Case study	x		x	x		
Kim, J., Wigram, T., & Gold, C. (2009). Emotional, motivational and interpersonal responsiveness of children with autism in improvisational music therapy. Autism : The International Journal of Research and Practice, 13(4), 389–409. https://doi.org/10.1177/1362361309105660	Children	Psychosocial		Within-subject design			x			
LaGasse, A. B. (2014). Effects of a music therapy group intervention on enhancing social skills in children with autism. Journal of Music Therapy, 51(3), 250–275. https://doi.org/10.1093/jmt/thu012	Children	Cognitive	Psychosocial	Randomized controlled trial	x		x	x		
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. https://doi.org/10.2147/PROM.S106267	Children	Cognitive					x	x		
Lam, H. L., Li, W. T. V., Laher, I., & Wong, R. Y. (2020). Effects of music therapy on patients with dementia—A systematic review. Geriatrics, 5(4), 62. https://doi.org/10.3390/geriatrics5040062	Older adults	Neurological		Systematic review / meta-analysis	x		x	x		
Lee, J.- young, & McFerran, K. (2012). The Improvement of Non-Verbal Communication Skills of Five Females with Profound and Multiple Disabilities Using Song-Choices in Music Therapy. Voices: A World Forum for Music Therapy, 12(3). https://doi.org/10.15845/voices.v12i3.644	Adults	Physical	Intellectual	Pre-post (pilot study)	x		x			

Lici, E., Avdulaj, E., Zhapaj, A., & Lamaj, P. D. I. (2024). The Effect Of Music Education On The Development Of Students With Autism Spectrum Disorders And Intellectual Disabilities: A Systematic Review Of The Literature. Educational Administration: Theory and Practice, 30(5), 2229-2238. https://kuey.net/index.php/kuey/article/view/3269/2083	Adolescents	Intellectual	Neurological	Systematic review / meta-analysis	x		x	x		
Low, B., Liu, X., Li, R. Z., Ren, E., & Zhang, J. X. (2024, October). Music Therapy for Autism Spectrum Disorder: A Comprehensive Literature Review on Therapeutic Efficacy, Limitations, and AI Integration. In 2024 IEEE 15th Annual Ubiquitous Computing, Electronics & Mobile Communication Conference (UEMCON) (pp. 90-99). IEEE. https://doi.org./10.1109/UEMCON62879.2024.10754769	Children	Neurological		Systematic review / meta-analysis			x			
Ma, Y., Nagler, J., Lee, M., & Cabrera, I. (2001). Impact of music therapy on the communication skills of toddlers with pervasive developmental disorder. Annals of the New York Academy of Sciences, 930, 445-447. doi: 10.1111/j.1749-6632.2001.tb05766.x	Children	Cognitive		Case study	x		x	x		
Magee, W. L., Baker, F., Daveson, B., et al. (2011). Music therapy methods with children, adolescents, and adults with severe neurobehavioral disorders due to brain injury. Music Therapy Perspectives, 29(1), 5–13. https://doi.org/10.1093/mtp/29.1.5	Children	Neurological	Psychosocial	Case study	x		x	x		
Marquez-Garcia, A. V., Magnuson, J., Morris, J., Iarocci, G., Doesburg, S., & Moreno, S. (2022). Music therapy in Autism Spectrum Disorder: a systematic review. Review Journal of Autism and Developmental Disorders, 9(1), 91–107. https://doi.org/10.1007/s40489-021-00246-x	Mixed ages	Psychosocial	Sensory	Systematic review / meta-analysis	x		x	x		
Martínez-Vérez, V., Gil-Ruíz, P., & Domínguez-Lloria, S. (2024). Interventions through art therapy and music therapy in autism spectrum disorder, ADHD, language disorders, and learning disabilities in pediatric-aged children: A systematic review. Children, 11(6), Article 706. https://doi.org/10.3390/children11060706	Children	Neurological	Sensory	Systematic review / meta-analysis	x		x	x		

McDermott, O., Crellin, N., Ridder, H. M., & Orrell, M. (2013). Music therapy in dementia: a narrative synthesis systematic review. International journal of geriatric psychiatry, 28(8), 781-794.	Older adults	Neurological		Systematic review / meta-analysis			x	x		
McFerran, K. S., & Shoemark, H. (2013). How musical engagement promotes well-being in education contexts: The case of a young man with profound and multiple disabilities. International journal of qualitative studies on health and well-being, 8(1), 20570. doi:10.3402/qhw.v8i0.20570	Adolescents	Intellectual	Physical	Case study			x			
McFerran, K., Thompson, G., & Bolger, L. (2016). The impact of fostering relationships through music within a special school classroom for students with autism spectrum disorder: an action research study. Educational Action Research, 24(2), 241-259. https://doi.org/10.1080/09650792.2015.1058171	Children	Neurological	Intellectual	Mixed methods			x			
Mossler, K., Gold, C., Assmus, J., Schumacher, K., Calvet, C., Reimer, S., . . . Schmid, W. (2019). The therapeutic relationship as predictor of change in music therapy with young children with Autism Spectrum Disorder. Journal of Autism and Developmental Disorders, 49(7), 2795-2809. doi:10.1007/s10803-017-3306-y	Children	Psychosocial		Pre-post (pilot study)			x			
Pavlicevic, M., O'Neil, N., Powell, H., Jones, O., & Sampathianaki, E. (2014). Making music, making friends: Long-term music therapy with young adults with severe learning disabilities. Journal of intellectual disabilities, 18(1), 5-19. doi:10.1177/1744629513511354	Young adults	Intellectual	Psychosocial	Qualitative study			x	x	x	
Rabeyron, T., Robledo Del Canto, J. P., Carasco, E., & et al. (2020). A randomized controlled trial of 25 sessions comparing music therapy and music listening for children with autism spectrum disorder. Psychiatry Research, 293, 113377. https://doi.org/10.1016/j.psychres.2020.113377	Children	Psychosocial	Cognitive	Randomized controlled trial	x		x	x		
Sharda, M., Tuerk, C., Chowdhury, R., Jamey, K., Foster, N., Custo-Blanch, M., ... & Hyde, K. (2018). Music improves social communication and auditory–motor connectivity in children with autism. Translational psychiatry, 8(1), 231. doi:10.1038/s41398-018-0287-3	Children	Sensory	Psychosocial	Randomized controlled trial	x		x	x		

Shi, Z. M., Lin, G. H., & Xie, Q. (2016). Effects of music therapy on mood, language, behavior, and social skills in children with autism: A meta-analysis. Chinese Nursing Research, 3(3), 137-141. https://doi.org/10.1016/j.cnre.2016.06.018	Children	Sensory		Systematic review / meta-analysis	x		x	x		
Simpson, K., & Keen, D. (2011). Music interventions for children with autism: Narrative review of the literature. Journal of autism and developmental disorders, 41, 1507-1514. https://doi.org/10.1007/s10803-010-1172-y	Children	Neurological		Systematic review / meta-analysis	x		x	x		
Spiro, N., Tsiris, G., & Cripps, C. (2018). A systematic review of outcome measures in music therapy. Music Therapy Perspectives, 36(1), 67–78. https://doi.org/10.1093/mtp/mix011	Mixed ages			Systematic review / meta-analysis	x		x	x		
Thompson, G. A., McFerran, K. S., & Gold, C. (2014). Family-centred music therapy to promote social engagement in young children with severe autism spectrum disorder: A randomized controlled study. Child: Care, Health and Development, 40(6), 840-852. https://doi.org/10.1111/cch.12121	Children	Neurological	Intellectual	Randomized controlled trial			x			
Thompson, G., & McFerran, K. (2015). "We've got a special connection": Qualitative analysis of descriptions of change in the parent-child relationship by mothers of young children with autism spectrum disorder. Nordic Journal of Music Therapy, 24(1), 3-26. https://doi.org/10.1080/08098131.2013.858762	Children	Neurological	Intellectual	Qualitative study			x			
Thompson, G., & McFerran, K. (2015). Music therapy with young people who have profound intellectual and developmental disability: Four case studies exploring communication and engagement within musical interactions. Journal of Intellectual and Developmental Disabilities, 40(1), 1-11. https://doi.org/10.3109/13668250.2014.965668	Adolescents	Physical	Intellectual	Pre-post (pilot study)	x		x			
Thompson, Z., & Khalil-Salib, L. (2021). Online music therapy groups during COVID-19: Perspectives from NDIS participants and caregivers. Australian Journal of Music Therapy, 32(1), 53–63.	Adults	Cognitive	Intellectual	Mixed methods	x		x	x	x	
Tseng, P. T., Chen, Y. W., Lin, P. Y., et al. (2016). Significant treatment effect of adjunct music therapy to standard treatment on the positive, negative, and mood symptoms of schizophrenic patients: A meta-analysis. BMC Psychiatry, 16, 16. https://doi.org/10.1186/s12888-016-0718-8	Adults	Psychosocial	Cognitive	Systematic review / meta-analysis	x		x	x		

Tsirigoti, A., & Georgiadi, M. (2024). The efficacy of music therapy programs on the development of social communication in children with Autism Spectrum Disorder: A systematic review. Education Sciences, 14(4), 373. https://doi.org/10.3390/educsci14040373	Children	Psychosocial		Systematic review / meta-analysis			x	x		
van Laar, C., Bloch-Atefi, A., Grace, J., & Zimmermann, A. (2025). Empowering voices—Learning from NDIS participants about the value of creative and experiential therapies: A mixed methods analysis of testimonials and academic literature. Psychotherapy and Counselling Journal of Australia. https://doi.org/10.59158/001c.128556	Mixed ages	Cognitive	Physical	Mixed methods	x	x	x	x		
Wheeler, B. L., Shiflett, S. C., & Nayak, S. (2003). Effects of number of sessions and group or individual music therapy on mood and behavior of people with stroke or traumatic brain injuries. Nordic Journal of Music Therapy, 12(2), 139-151. https://doi.org/10.1080/08098130309478084	Adults	Neurological	Psychosocial	Non-randomized controlled study		x	x	x		
Whipple, J. (2004). Music in intervention for children and adolescents with autism: A meta-analysis. Journal of music therapy, 41(2), 90-106. https://doi.org/10.1093/jmt/41.2.90	Children	Neurological		Systematic review / meta-analysis	x		x	x		
Yasuhara, A., Sugiyama, Y. (2001). Music therapy for children with Rett Syndrome. Brain and Development, 23, (1), S82-84. doi: 10.1016/s0387-7604(01)00336-9	Children	Neurological	Cognitive	Case study	x	x	x			
Yoo, G. E., & Kim, S. J. (2018). Dyadic drum playing and social skills: Implications for rhythm-mediated intervention for children with Autism Spectrum Disorder. The Journal of Music Therapy, 55(3), 340–375. https://doi.org/10.1093/jmt/thy013	Children	Psychosocial		Mixed methods	x		x			
Zhang, Y., Cai, J., An, L., et al. (2017). Does music therapy enhance behavioral and cognitive function in elderly dementia patients? A systematic review and meta-analysis. Ageing Research Reviews, 35, 1–11. https://doi.org/10.1016/j.arr.2016.12.003	Older adults	Neurological		Systematic review / meta-analysis			x	x		

Appendix 6

Mobility and Movement

Citations: MOBILITY & MOVEMENT	Participant age group	Impairment (primary)	Impairment (secondary)	Research design	language & communication	mobility & movement	interpersonal interactions	functioning (inc. psychosocial functioning)	community living	personal care
Barnish, M. S., & Barran, S. M. (2020). A systematic review of active group-based dance, singing, music therapy and theatrical interventions for quality of life, functional communication, speech, motor function and cognitive status in people with Parkinson's disease. BMC neurology, 20, 1-15. doi:10.1186/s12883-020-01938-3	Older adults	Neurological		Systematic review / meta-analysis		x		x		
Bharathi, G., Jayaramayya, K., Balasubramanian, V., & Vellingiri, B. (2019). The potential role of rhythmic entrainment and music therapy intervention for individuals with autism spectrum disorders. Journal of exercise rehabilitation, 15(2), 180–186. doi:10.12965/jer.1836578.289	Children	Neurological	Psychosocial	Systematic review / meta-analysis	x	x	x	x	x	
Bower, J., Catroppa, C., Grocke, D., & Shoemark, H. (2014). Music therapy for early cognitive rehabilitation post-childhood TBI: An intrinsic mixed methods case study. Developmental Neurorehabilitation, 17(5), 339–346. https://doi.org/10.3109/17518423.2013.778910	Children	Cognitive	Physical	Mixed methods	x	x	x	x		
Bukowska, A. A., Krężałek, P., Mirek, E., Bujas, P., & Marchewka, A. (2016). Neurologic music therapy training for mobility and stability rehabilitation with Parkinson's disease – A pilot study. Frontiers in Human Neuroscience, 9. https://doi.org/10.3389/fnhum.2015.00710	Older adults	Neurological	Physical	Randomized controlled trial		x		x		

Burns, J., Healy, H., O'Connor, R., Moss, H., Sena Moore, K., & Jacobsen, S. L. (2024). Integrative Review of Music and Music Therapy Interventions on Functional Outcomes in Children with Acquired Brain Injury. The Journal of Music Therapy. https://doi.org/10.1093/jmt/thae017	Children	Cognitive	Neurological	Systematic review / meta-analysis	x	x				
Chou, M. Y., Chang, N. W., Chen, C., Lee, W. T., Hsin, Y. J., Siu, K. K., ... & Hung, P. L. (2019). The effectiveness of music therapy for individuals with Rett syndrome and their families. Journal of the Formosan Medical Association, 118(12), 1633-1643. doi:10.1016/j.jfma.2019.01.001	Children	Intellectual		Randomized controlled trial	x	x	x			
Devlin, K., Alshaikh, J. T., & Pantelyat, A. (2019). Music therapy and music-based interventions for movement disorders. Current Neurology and Neuroscience Reports, 19(11), 1-13. doi:https://doi.org/10.1007/s11910-019-1005-0				Systematic review / meta-analysis		x				
Fan, Q., Ding, M., Cheng, W., Su, L., Zhang, Y., Liu, Q., & Wu, Z. (2024). The clinical effects of Orff music therapy on children with autism spectrum disorder: a comprehensive evaluation. Frontiers in Neurology, 15, 1387060-. https://doi.org/10.3389/fneur.2024.1387060	Infants	Cognitive	Psychosocial	Non-randomized controlled study	x	x	x			
Ghai, S. (2023). Does Music Therapy Improve Gait after Traumatic Brain Injury and Spinal Cord Injury? A Mini Systematic Review and Meta-Analysis. Brain Sciences (2076-3425), 13(3), 522. https://doi.org/10.3390/brainsci13030522	Adults	Physical		Systematic review / meta-analysis		x				
Hurt, C.P., Rice, R.R., McIntosh, G.C., & Thaut, M.H. (1998). Rhythmic auditory stimulation in gait training for patients with traumatic brain injury. Journal of Music Therapy, 35(4), 228-241. https://doi.org/10.1093/jmt/35.4.228	Adults	Neurological	Physical	Pre-post (pilot study)		x		x		
Kwak, E.E. (2007). Effect of rhythmic auditory stimulation on gait performance in children with spastic cerebral palsy. Journal of Music Therapy, 44(3), 198-216. https://doi.org/10.1093/jmt/44.3.198	Children	Physical	Neurological	Randomized controlled trial		x		x		
Lopes, J., & Keppers, I. I. (2021). Music-based therapy in rehabilitation of people with multiple sclerosis: a systematic review of clinical trials. Arquivos de Neuro-Psiquiatria, 79(6), 527-535. http://dx.doi.org/10.1590/0004-282X-ANP-2020-0374	Adults	Neurological	Physical	Systematic review / meta-analysis		x		x		

Machado Sotomayor, M. J., Arufe-Giráldez, V., Ruíz-Rico, G., & Navarro-Patón, R. (2021). Music therapy and Parkinson's disease: A systematic review from 2015–2020. International Journal of Environmental Research and Public Health, 18(21), 11618. https://doi.org/10.3390/ijerph182111618	Adults	Neurological		Systematic review / meta-analysis	x	x		x		
Magee, W. L., Clark, I., Tamplin, J., & Bradt, J. (2017). Music interventions for acquired brain injury. Cochrane Database of Systematic Reviews. https://doi.org/10.1002/14651858.CD006787.pub3	Adults	Physical	Cognitive	Systematic review / meta-analysis	x	x		x		
Mishra, R., Florez-Perdomo, W. A., Shrivatava, A., Chouksey, P., Raj, S., Moscote-Salazar, L. R., ... & Agrawal, A. (2021). Role of music therapy in traumatic brain injury: A systematic review and meta-analysis. World neurosurgery, 146, 197-204. https://doi.org/10.1016/j.wneu.2020.10.130	Adults	Physical	Cognitive	Systematic review / meta-analysis		x		x		
Peng, Y.-C., Lu, T.-W., Wang, T.-H., Chen, Y.-L., Liao, H.-F., Lin, K.-H., & Tang, P.-F. (2011). Immediate effects of therapeutic music on loaded sit-to-stand movement in children with spastic diplegia. Gait & Posture, 33(2), 274–278. https://doi.org/10.1016/j.gaitpost.2010.11.020						x				
Raghavan, P., Geller, D., Guerrero, N., Aluru, V., Eimicke, J. P., Teresi, J. A., ... & Turry, A. (2016). Music upper limb therapy—integrated: an enriched collaborative approach for stroke rehabilitation. Frontiers in Human Neuroscience, 10, 498. doi:10.3389/fnhum.2016.00498	Adults	Intellectual		Non-randomized controlled study		x		x		
Thaut, M. H., McIntosh, G. C., & Hoemberg, V. (2015). Neurobiological foundations of neurologic music therapy: Rhythmic entrainment and the motor system. Frontiers in Psychology, 5, 1185. https://doi.org/10.3389/fpsyg.2014.01185						x				
Twyford, K., Taylor, S., Valentine, J., Pool, J., Baron, A., & Thornton, A. (2024). Functional outcomes in children and adolescents with neurodisability accessing music therapy: A scoping review. Developmental Medicine and Child Neurology. https://doi.org/10.1111/dmcn.16135	Adolescents	Physical	Cognitive	Systematic review / meta-analysis	x	x		x		

van Laar, C., Bloch-Atefi, A., Grace, J., & Zimmermann, A. (2025). Empowering voices—Learning from NDIS participants about the value of creative and experiential therapies: A mixed methods analysis of testimonials and academic literature. Psychotherapy and Counselling Journal of Australia. https://doi.org/10.59158/001c.128556	Mixed ages	Cognitive	Physical	Mixed methods	x	x	x	x		
Vinolo-Gil, M. J., Casado-Fernández, E., Perez-Cabezas, V., Gonzalez-Medina, G., Martín-Vega, F. J., & Martín-Valero, R. (2021). Effects of the combination of music therapy and physiotherapy in the improvement of motor function in cerebral palsy: A challenge for research. Children, 8(10), 868. doi:https://doi.org/10.3390/children8100868				Systematic review / meta-analysis		x				
Weller, C. M., & Baker, F. A. (2011). The role of music therapy in physical rehabilitation: a systematic literature review. Nordic Journal of Music Therapy, 20(1), 43-61. doi:10.1080/08098131.2010.485785	Mixed ages	Physical		Systematic review / meta-analysis		x		x		
Wheeler, B. L., Shiflett, S. C., & Nayak, S. (2003). Effects of number of sessions and group or individual music therapy on mood and behavior of people with stroke or traumatic brain injuries. Nordic Journal of Music Therapy, 12(2), 139-151. https://doi.org/10.1080/08098130309478084	Adults	Neurological	Psychosocial	Non-randomized controlled study		x	x	x		
Yanagiwara, S., Yasuda, T., Koike, M., Okamoto, T., Ushida, K., & Momosaki, R. (2022). Effects of music therapy on functional ability in people with cerebral palsy: a systematic review. Journal of Rural Medicine, 17(3), 101-107. doi:10.2185/jrm.2022-014	Children	Neurological		Systematic review / meta-analysis		x		x		
Yang, S., Suh, J. H., Kwon, S., & Chang, M. C. (2022). The effect of neurologic music therapy in patients with cerebral palsy: A systematic narrative review. Frontiers in Neurology, 13, 852277. https://doi.org/10.3389/fneur.2022.852277	Mixed ages	Physical		Systematic review / meta-analysis		x				
Yasuhara, A., Sugiyama, Y. (2001). Music therapy for children with Rett Syndrome. Brain and Development, 23, (1), S82-84. doi: 10.1016/s0387-7604(01)00336-9	Children	Neurological	Cognitive	Case study	x	x	x			
Yoo, G.E., & Kim, S.J. (2016). Rhythmic auditory cueing in motor rehabilitation for stroke patients: Systematic review and meta-analysis. Journal of	Older adults	Neurological	Physical	Systematic review / meta-analysis		x		x		

Music Therapy, 53(2), 149–177. https://doi.org/10.1093/jmt/thw003										

Appendix 7

Community Living

Citations: COMMUNITY LIVING	Participant age group	Impairment (primary)	Impairment (secondary)	Research design	language & communication	mobility & movement	interpersonal interactions	functioning (inc. psychosocial functioning)	community living	personal care
Bharathi, G., Jayaramayya, K., Balasubramanian, V., & Vellingiri, B. (2019). The potential role of rhythmic entrainment and music therapy intervention for individuals with autism spectrum disorders. Journal of exercise rehabilitation, 15(2), 180–186. doi:10.12965/jer.1836578.289	Children	Neurological	Psychosocial	Systematic review / meta-analysis	x	x	x	x	x	
Gassner, L., Geretsegger, M., & Mayer-Ferbas, J. (2021). Effectiveness of music therapy for autism spectrum disorder, dementia, depression, insomnia, and schizophrenia: Update of systematic reviews. European Journal of Public Health, 32(1), 27–34. https://doi.org/10.1093/eurpub/ckab042	Mixed ages	Psychosocial		Systematic review / meta-analysis	x		x	x	x	
Gold, C., Mössler, K., Grocke, D., Heldal, T. O., Tjemsland, L., Aarre, T., ... & Rolvsjord, R. (2013). Individual music therapy for mental health care clients with low therapy motivation: Multicentre randomised controlled trial. Psychotherapy and Psychosomatics, 82(5), 319-331. https://doi.org/10.1159/000348452	Adults	Psychosocial		Randomized controlled trial			x	x	x	
Pavlicevic, M., O'Neil, N., Powell, H., Jones, O., & Sampathianaki, E. (2014). Making music, making friends: Long-term music therapy with young adults with severe learning disabilities. Journal of intellectual disabilities, 18(1), 5-19. doi:10.1177/1744629513511354	Young adults	Intellectual	Psychosocial	Qualitative study			x	x	x	
Thompson, Z., & Khalil-Salib, L. (2021). Online music therapy groups during COVID-19: Perspectives from NDIS participants and caregivers. Australian Journal of Music Therapy, 32(1), 53–63.	Adults	Cognitive	Intellectual	Mixed methods	x		x	x	x	

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Windle, E., Hickling, L. M., Jayacodi, S., & Carr, C. (2020). The experiences of patients in the synchrony group music therapy trial for long-term depression. The Arts in Psychotherapy, 67, Article 101580. https://doi.org/10.1016/j.aip.2019.101580	Adults	Psychosocial	Psychosocial	Qualitative study	x			x	x	

Appendix 8

Personal Care

Citations: PERSONAL CARE	Participant age group	Impairment (primary)	Impairment (secondary)	Research design	language & communication	mobility & movement	interpersonal interactions	functioning (inc. psychosocial functioning)	community living	personal care
Chou, C. H., Chen, P. C., Huang, Y. C., Yang, T. H., Wang, L. Y., Chen, I. H., ... & Lee, Y. Y. (2024). Neurological music therapy for poststroke depression, activity of daily living and cognitive function: A pilot randomized controlled study. Nordic Journal of Music Therapy, 33(3), 226-237. doi:10.1080/08098131.2023.2280968	Adults	Neurological		Randomized controlled trial				x		x
Van der Walt, M., & Baron, A. (2006). The role of music therapy in the treatment of a girl with pervasive refusal syndrome: exploring approaches to empowerment. Australian Journal of Music Therapy, 17, 35-53. https://www.proquest.com/scholarly-journals/role-music-therapy-treatment-girl-with-pervasive/docview/208663882/se-2	Children	Psychosocial	Intellectual	Case study						x