DOI: 10.35218/rae-2025-0001 Review of Artistic Education no. 29 2025 1 - 14
https://doi.org/10.35218/rae-2025-0001

NUMBER 29

PART I MUSIC

1. APPLICABILITY OF MUSIC THERAPY, PLAY THERAPY AND SNOEZELEN IN CHILDREN WITH AUTISM SPECTRUM DISORDER

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Abstract: *Autism spectrum disorder (ASD) affects a child's brain development and the processing of information. It is characterised by a deficit in social communication, restrictive and repetitive behaviours, social and occupational impairments, and other areas of functioning. The contribution focuses on the development of social and communication skills, sensory perception, and the development of attention and imagination in children with ASD. The objective of contribution is a general overview of evidence-based therapies with the potency to development of social skills and communication in children with ASD. We used the method of analysis and synthesis of relevant research and practice in therapeutic environments. There is a growing interest in non-pharmacological based interventions, using auditory and sensory integration practices, in the treatment of ASD. The proper care for a child with ASD includes the cooperation of a multidisciplinary team of experts in health departments (a child psychiatrist or a paediatric psychiatrist, clinical psychologist, clinical speech therapist, therapeutic pedagogue) supplemented by multiprofessional cooperation with experts as educators and psychologists. Therapies have an important place in the health care of children with ASD. They offer therapeutic procedures which expand the focus on the development of social interaction, communication, emotional development, behaviour modification, and sensory integration. They can alleviate ASD symptoms and include behavioural interventions, interventions aimed at speech and sensory integration.*
Key words: *Autism Spectrum Disorder (ASD), developmental needs, music therapy, play therapy, Snoezelen*

1. Introduction

According to the Diagnostic and Statistical Manual of Mental Disorders (DSM-5), **autism spectrum disorder (ASD)** is characterised by a permanent deficit in social communication, restrictive and repetitive behaviours (RRB), social and occupational impairments, and other areas of functioning. Social communication includes social initiations (starting play or conversations with others), social reciprocity (taking turns in communications), synchrony (meaningfully linking conversation to the topic), and understanding and expressing appropriate nonverbal behaviour such as gestures or facial expressions (APA, 2017).

RRB may include stereotypic behaviour or speech, fixation on or interests in specific topics (e.g., trains, dinosaurs), and strict adherence to routines, with discomfort when they change or are altered. In its most severe form, RRB is

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expressed in self-injurious behaviour. Not all children and youth with autism have all these behaviours. A popular saying is that if you have seen "one autistic child you have seen one autistic child," meaning that autism manifests in many ways. Autism is a "spectrum" condition. Spectrum means that there is a range of abilities and impairments that occur for people with autism (Steinbrenner, J. R. et al., 2020).

Pervasive developmental disorders are manifested in the first years of life. The biggest difficulties arise when children join the collective, for example at kindergarten. The behaviour of children with ASD is different in the group of other children and they draw attention to themselves with different and even bizarre behaviour compared to healthy children. In the diagnosis of ASD, psychiatric and psychological examinations, examinations of mental abilities, as well as examination of speech, motor skills and determination of children maturity are used (K. Thorová, 2016).

2. The Needs of Children with ASD

Autism spectrum disorder affects a child's brain development and how they process information. That's why children with autism need more sensory, communication, and social help than healthy children. As part of the therapy, we focus on the development of social, communication skills, sensory perception, and the development of attention and imagination in children with ASD.

2.1. Social Skills Development

In social skills of children with ASD can be observed solitary, extreme and mixed behaviour:

- In solitary behaviour, when children are trying to make social contact, they turn away, withdraw or hide, cover their eyes, ears, devote their attention to some objects.
- In extreme behaviour, they try to find social contact with everyone and everywhere. They touch people, look them straight in their eyes, talk to them.
- In mixed behaviour the intermingling of solitary and extreme behaviour can be observed.

Children with ASD can act awkwardly in some situations in a group or with an unknown person. They can establish active contact with someone they know well (K. Thorová, 2016). It is difficult for them to recognize emotions (A. Landowska et al., 2022).

Supporting social interaction is an important piece of meeting the need of children with ASD who often have the desire to interact with others but need the skills to engage properly.

2.2. Communication Skills Development

Communication disorder in children with ASD is manifested in their understanding and in both verbal and non-verbal communication:

- When they have expressive language impairments, some of them do not speak at all. If the child does not understand speech, he or she understands only simple instructions, we are talking about a disorder of the receptive component of speech.
- In a mixed form of autism, children do not understand or speak. Parents who have children with ASD often talk about their children's communication problems in the sense of often talking to themselves, asking the same questions over and over, often

talking only about topics that are interesting to them, talking about themselves in the third person (K. Thorová, 2016).

Communication can take place without tools, using manual signs, but also with tools. The tools include various images, pictograms, photographs, books, computers, tablets. Therapists use them for active communication and to support speech understanding (J. Šarounová, 2014).

2.3. The Development of Imagination and Imaginative Play

A lack of imagination makes children tend to seek out activities and activities that are usually preferred by much younger children. They rely on activities that are familiar to them and become stereotyped for them. The development of the game and its quality depends on the ability of imagination, motor skills and level of thinking. Because they do not develop playing, there is a learning problem. In their free time, they do not show interest in new games and toys, except for non-standard playing with toys. In some children, we can observe the simplest type of manipulation with objects such as spinning, swinging, waving, throwing, banging.

At a higher mental level, can be mentioned sorting, ordering, arranging objects according to a certain type (shape, colour, size). There is often observed an interest in numbers, letters, building puzzles (K. Thorová, 2016). Children with ASD have been shown to have originality in their thoughts. Understanding autism as a different way of thinking and processing makes it easier to see how creative they can be. Since the aspects of creativity are a part of the diagnostic process of autism, knowing how creativity is related to a child's psychological functioning can be important in differentiating between autistics and neurotypicals (E. Arefaine, 2023).

2.4. Sensory Development

The differences in the perception of sensory stimuli can be observed in children with ASD compared to healthy children. From the point of view of the application of therapeutic interventions, changes in the perception of visual, auditory, vestibular and tactile stimuli are significant. When it comes to changes in perception, we talk about hyposensitive and hypersensitive children with ASD (K. Thorová, 2016).

Visual perception: Some children with ASD observe an object through the outer corner of the eye, or bring it close to their eyes, or, conversely, unusually far away. Visual perception is often detail oriented. For therapy, the problem is hypersensitivity to visual stimuli, which can manifest itself in a way that the child reacts oversensitively; for example, to strong sunlight, changes in lighting, flickering of the TV screen or monitor. On the contrary, therapists can try to hold the interest of hyposensitive children with these stimuli (K. Thorová, 2016).

Auditory perception: Sometimes the child does not respond even to a very loud sound near him or her, and at other times s/he responds even to a very weak sound. Some children will only respond to sound if they are not engaged in something else at the same time, while others will also respond to a very insignificant sound in their surroundings such as rustling of clothes (B. S. Myles, 2005, S. Richman 2006). Hypersensitivity to sound stimuli means that some sounds that do not bother healthy children can make children with ASD feel uncomfortable. These are often common sounds like for example children's voices, whistling, the sound of the sea, sounds in a CD player (K. Thorová 2016). The biggest problem is a hyposensitive response to speech. Children act as if they do not hear what the

person is saying to them. They act absent-minded, often not even responding to their own name (B. S. Myles, et al., 2005).

Tactile perception: Children with ASD are often very sensitive to touch, which is perceived as a potential danger. They may not have a problem with touching another person, but they cannot tolerate unwanted touch on their own body (P. Aquilla, et al., 2015). Many children with ASD like to undress and take off their shoes, they can't stand wearing tight clothes and the texture of textiles on their skin (O. Bogdashina, et al., 2016). Hyposensitivity can be manifested by the fact that children with ASD often fail in new activities because they do not want to explore objects by touch, and this contributes to a certain dyspraxia (K. Thorová, 2016).

Vestibular system: It enables the perception of movement and balance. Hypersensitive children do not tolerate merry-go-rounds, swings or travelling by car. They are often disoriented after running and jumping (O. Bogdashina 2016). It is difficult for hyposensitive children with ASD to adapt to changes in body position, for example to make the transition from sitting to standing and vice versa. They have problems maintaining balance, they avoid activities that require it. They are not aware of the risks posed by moving objects like swings and cars (B.S. Myles et al. 2005).

2.5. Attention in Children with Autism

Children with ASD often and excessively focus on a specific detail while overlooking broader aspects of the situation (selective attention). Hypersensitivity to sensory stimuli (visual and auditory) leads to their frequent distraction. In addition to the above mentioned, children with ASD have difficulty moving from one activity to another. If they are focused on one task, they cannot shift their attention to another activity. Changing their stereotypes and rituals will also disrupt their attention. In addition to selective attention, children with ASD may also be impaired in the so-called joint attention. It means that they do not have the ability to share their attention with others (F. Happé, U. Frith, 2006).

3. Music Therapy, Sneozelen and Play in the Development of Children's with ASD Needs

There is a growing interest **in non-pharmacological based interventions**, using auditory and sensory integration practices, in the treatment of ASD. Proper care for a child with ASD includes the cooperation of a multidisciplinary team of experts in the health department (a paediatric psychiatrist, clinical psychologist, clinical speech therapist, therapeutic pedagogue) supplemented by multiprofessional cooperation with experts in other departments, especially in the department of the Ministry of Education, Research, and Development and Youth of the Slovak Republic (counselling and prevention, school psychologist, school speech therapist, school special or remedial teacher); and in the department of the Ministry of Labour, Social Affairs and Family of the Slovak Republic; it means early intervention service providers (ISP).

Therapies have an important place in the health care of children with ASD. They offer therapeutic procedures which expand the focus on the development of social interaction, communication, emotional development, behaviour modification, and sensory integration. Music therapy, Snoezelen and play therapy can work to

alleviate PAS symptoms and include behavioural interventions (behaviour modification interventions), speech therapy interventions, interventions aimed at sensory processing of environmental stimuli (sensory integration).

3.1. Music Therapy

Music therapy (MT) is an approach that offers a clinical and evidence-based intervention within a therapeutic frame to target the physical, emotional, cognitive, and social needs of an individual. It might be organised as self-help, individual, group-based, or peer-mediated therapy. MT intervention is significant for individuals with ASD to maximize their potential and lead fulfilled lives (AMTA, 2015). Music interventions may induce joint attention, intensify auditory processing, other sensory motor skills, perceptual motor skills, or gross/fine motor skills (A. B. LaGasse, M. W. Hardy, 2013); identify and appropriately express emotions (J. Katagiri, 2009); sound and vibrations can be used for the physiological and biochemical processes of the body, to reduce stress and to achieve functional objectives such as practicing and training abilities and skills weakened due to autism (M. Habalová, 2023).

Group-based MT provides an indirect form of communication, which improves engagement in people with ASD. A report from the "National Clearinghouse on Autism Evidence and Practice" lists MT as evidence-based practice for children (ages 0-14) under music-mediated interventions (J. R. Steinbrenner, et al., 2020). Z. Fábry Lucká & M. Habalová (2022) claim that music can affect children with its rhythm, timbre, pitch, melody, harmony, and dynamics as we respond to them. Our response evoked by music can manifest itself on a somatic, cognitive, emotional, communicative, and social level, with music acting as stimulating (faster tempo, strong rhythm, higher volume, more pronounced dynamic changes and contrasts, gradation, staccato, variations of tones, sounds, melodies) and calming – (slower tempo, small dynamic changes, lower volume, legato).

Incorporating music activities into therapy sessions can be highly effective for children with ASD. Therapists can design the activities to meet the unique needs and interests of each child. By considering their preferences, and developmental needs, MT can be personalized to maximize engagement and therapeutic outcomes. **It can promote** social interaction and communication skills: encourage sharing, turn-taking, cooperation, fostering social engagement and teamwork. Through these activities, children with ASD can develop important social skills while building connections with others (M. Geretsegger et al., 2014).

A systematic review that discusses MT finds that MT is highly effective in increasing developmental aspect as social interaction, verbal and non-verbal communication skills (D. A. Rossignol, 2009). J. Y. K. Chiang (2008) believes that MT may have specific purposes like motor development, communication and language development, social development, emotional development, and cognitive development. It can also help develop fine motor skills and gross motor skills as well as physical coordination. In emotional development, music can be used as the medium to express feelings and emotions, which encourage self-expression (E. H. Boxill, K. M. Chase, 2007). These findings indicate the potential of MT for the development of children with ASD. Based on the purpose, MT for children with

autism spectrum disorder has the following purposes: communication, social, emotional development, motor skills, daily activities, and academic skills (G. Thompson, 2012).

The specific content for therapy of children with ASD and their auditory and language developmental characteristics:

- *Rhythm training:* during therapy children may be exposed to simple sounds (animal and trumpet sounds) for auditory training, and familiar figures and objects (such as names and vehicle) can be incorporated into rhythmic nursery rhymes or poems for rhythm training.
- *Body movement instruction:* Therapy can be conducted using body percussion, children coordinated their bodies with different tones and rhythms, engaging in activities such as clapping, finger-snapping, thigh-slapping, and foot-stomping, to enhance their coordination of body movements with rhythm.
- And *music instrument instruction*: Rhythmic, non-pitched percussion instruments, such as drumsticks, wood blocks, chimes, sand hammers, clappers, and triangles, were used to develop children's sense of rhythm, musicality, and auditory abilities.
- *Orff music therapy* can be conducted once or twice a week, with each session lasting 40 min Can be used for a group of four to five children with ASD, the language development quotient, cognitive development quotient, and social development quotient of the groups of children with ASD should be matched.

Picture 1 Music therapy with children with ASD

Some elements of music therapy procedures can also be applied in a age children, since the usual procedures of music education are not satisfactory for meeting all the goals of education (P. Kusý, 2019). Among music therapies, a traditional distinction exists between **receptive MT techniques** – based mainly on listening – and **expressive MT techniques** – based on sound production by voice, body percussion, or use of instruments (E. Králová, J. Kantor, 2020).

Expressive individual MT focuses on interaction with music prepared by the therapist and from this interaction, client will create creative and collective products. Meanwhile in receptive MT a therapist prepares specific music; and through that music the therapist is expected to make psychological change on clients (K. S. McFerran et al., 2015). MT itself is categorized in various types, such as: Embedded MT interventions, improvisational MT, family-centred MT, and relational MT. Every type of MT has different purposes and procedures (I. C. S. Hale, F. Kurniawati, 2022).

1. Embedded MT recommends clear management of the physical environment including children's play areas, comprehensive visual information, predictable and routine scheduling, individualized and structured teaching, and the use of integration therapy. "Embedded" is a form of intervention that is implanted in ongoing classroom routines. It can increase the interaction of children with autism spectrum disorders with their peers in the playground.

2. Improvisational MT a therapist identifies the musical elements in a child's musical or non-musical behaviour (such as tempo, timbre, pitch, rhythmic patterns, and melody lines), then provides an empathetic and supportive musical structure to engage and engage the child (A. S. Møller et al., 2002). The main principle is to facilitate the harmony of music and emotions, scaffolding interactions with music, and leveraging shared experiences for musical interactions between children with ASD and therapists (M. Geretsegger et al., 2015). This type of MT can be beneficial for children with ASD because it connects clear structures that provide security, great flexibility that can help children with ASD learn to deal with a less structured, less expected and less clear world (T. Wigram, C. Elefant, 2009).

3. Family-centred MT emphasizes the important feature of its provision in natural settings such as the home environment.

4. Relational MT: Its objective is to help individuals develop their capacities (motor, communication, social, cognitive, and emotional) in accordance with the interactions that occur in the therapy process. Relational MT does not have a structured protocol for intervention. There are basic guidelines prepared to lead the therapy process in therapy sessions.

3.2. Snoezelen – Multi-Sensory Environments

The Snoezelen concept is considered a therapeutic method, but also a supportive educational method and a leisure activity. It is an environment that, on the one hand, creates a sense of well-being, relaxation and calmness, and on the other hand, activates, stimulates, awakens interest, directs and compares stimuli, evokes memories, reduces feelings of fear and anxiety, induces and supports safe relationships and brings joy. It is an integrated approach that can be applied as part of daily activities and care with the aim of active stimulation through light, sound, smell and taste stimuli (R. Filatová, K. Janků, 2010).

The essence of this concept is to provide individual multi-sensory stimulation in a calm environment, without the need and necessity of developing higher cognitive areas. However, the concept requires a modified environment and specific equipment, with which it is possible to increase the development of psychomotor skills, fine and gross motor skills, perception and cognitive components of personality (Snoezelen-MSE concept guide).

Picture 2 Sensory room for children with autism

Snoezelen is also called Snoezelen® room, and multi-sensory environments (MSEs). The Snoezelen® rooms were developed as a MSE and designed to provide multiple stimulation opportunities that cover all sensory channels. Their name comes from two Dutch words: "snuffelen", meaning to search or explore, and "doezelen", meaning to relax (C. de Domenico et al., 2024). Although MSEs are widely used with autistic children, there is a need for further evidence-based

research to support their use (A. Cameron et al., 2019). Snoezelen Multi-Sensory Environments are relaxing spaces that help reduce agitation and anxiety, but they can also engage and delight a child with ASD, stimulate reactions and encourage communication.

Relaxation: Snoezelen Multi-Sensory products and environments can be used to calm and reduce agitation using gentle light, soothing sound, relaxing smells and textures.

Stimulation: Snoezelen Multi-Sensory products and environments can be used to stimulate users by providing exciting visuals, music and sounds, invigorating smells and textures to explore.

3.3. Play therapy

Play is pleasurable, intrinsically motivating, process-oriented, freely selected physical or mental activity in which the child actively and spontaneously engages, mainly in a safe environment. Children should have fun, or it is not considered a play (R. Elbeltagi et al. 2023). It is a fundamental daily activity that allows children to learn and master skills that involve negotiation abilities, problem-solving, emotional intelligence, improving their manual dexterity, sharing, decision-making, and working within a group. It helps children to discover their interests; and it promotes the integration of mental development with social life (S. B. Campbell et al., 2016).

Play therapy is a therapeutic method that develops a mutual relationship between a child and a therapist. The therapist believes in the child's potential to help himself or herself and gives the child space to freely use his own strengths. In child-centred play therapy, the child manages his or her own play, chooses the toys to play with, and decides for himself or herself whether and how to involve the therapist in the play. Time spent in a specially equipped playroom is child-oriented (K. Koukourikos et al., 2021). The main objective is to prevent or solve psychosocial difficulties and achieve optimal growth and development (J. L. Johnson, 2015). It also trains the child to respect and accept himself and others, learn how to express feelings and emotions, and respect others' thoughts and feelings (J. Dougherty, D. Ray, 2007).

Imaginative play is playing pretend. This type of play is where children create their own storylines, role-play, or use toys or everyday objects in innovative ways. Creative and imaginative play is how children develop socially, emotionally, verbally, cognitively, and even physically (A. Nielsen, 2022). Imaginative play not only builds character, but also helps adults understand children's perspective and how they view and take in the world around them. During imaginative play, they get to be anyone, anything, be any place and experience life outside of reality (M. Spivey, 2022).

Picture 3 Imaginative play – children with ASD

Play therapy can be used as a diagnostic and therapeutic tool. The play therapist observes the child during playing to identify the child's problem; assess his/her problem. Then, the therapist deals with the problem accordingly by supporting the child to learn and execute self-expression and communicate via his/her thoughts of the inner world (K. Koukourikos et al, 2021). Each play therapy session lasts from 30 to 60 min, usually once a week. It can occur individually or in groups. Despite lacking play skills in children with ASD, they still can learn how to play, especially with the help of their parents and sibling (A. Yahaya et al, 2018). Elbeltagi et al. (2023) recommend using the following play therapies for children with ASD:

1. Child-centred play therapy is a relationship-based intervention, where the therapist enters the child's world and uses the built relationship to intervene rather than train the child. A. A. Schottelkorb, et al. (2020) found out that children who received intensive child-centred play therapy significantly reduced ASD core symptoms and behavioural disorders, such as attention problems, and aggression, then control group children.

2. Child-led play is a non-directive approach in which the therapist follows the child's choices and adapts the tools and environment to serve the therapeutic goals. It is an approach that allows the child to choose the activity they like to do, and the therapist joins them. It is usually helpful in severely affected children with autism, but it takes a longer time to see significant gains (R. A. Baum, 2019). Child-led play therapy has improved children's social and communication skills with severe autism. It differs from child-centred play therapy, in which there is a preset specific thing and rules the therapist will (not) do and a specific way of being in the playroom.

3. Floor time-play therapy is one of the most famous play therapies to treat children with ASD. It can be done at home and in the therapist's office, in a calm environment for a session between two to five hours. It can be provided by child psychologists, occupational therapists, speech therapists, special education teachers, parents, or caregivers with adequate training. Essentially, the therapist sits on the floor to play with the child according to the child's own terms. The therapist starts playing, following the child's way of playing (non-directive; the therapist follows, and the child leads). Then, the therapist introduces new elements, such as new toys, acts, or some words (hidden directive). This way of playing with back-and-forth conversations between the child and the therapist ultimately helps the child focus his thinking, improve his emotional skills, and expand his communication circles (R. Lal, R. Chhabria, 2013). The main aim of floor time play therapy is to meet the child's developmental level, build on the child's own comforts, interests, and strengths, and create relationships during the play course. It provides him with two-way communication that may progress to more complex communication (M. Dionne, R. Martini, 2011).

4. The 3i play therapy (intensive, individual, and interactive) works through play and is conducted at the child's home, with the involvement of volunteers to provide several hours daily of individual therapeutic relations to the child. It is an educative method with several elements, including the importance of play, with a low-intrusive approach that emphasizes interaction and behavioural dialogue and ensures the child's excellent and long-lasting mental stability (A. Gardziel et al.,

2015). E. Tilmont Pittala et al. (2018) studied 20 children with autism using the 3i method for two years. They found that children treated with the 3i method for two years had significant behavioural and developmental skills improvement with an evident decrease in autism severity. It indicates that the 3i method can be a valuable tool for children with ASD by improving their daily interactions and social environment.

5. Art-play therapy is a form of expressive and communicative therapy that uses the act of arty interest to decrease anxiety, enhance self-esteem and settle any psychological conflicts. However, child art therapy is sometimes confused with play therapy, as many play therapists include art-based activities during play therapy. Meanwhile, some art therapists use specific play tools such as toys, puppets, or even physical games to enforce and promote the child's artistic expression. Art therapy can be practiced individually or in groups, with a session usually lasting 30 to 50 min (L. Bosgraaf, et al, 2020, C. Hermann, 2021, C. West, 2008). J. Wypyszyńska et al. (2021) found that art therapy has a more positive therapeutic effect on speech, social relations, and unusual behaviour in children with ASD.

6. Synergetic play therapy (SPT) identifies the significance of the comprehensive therapeutic experience the child is exposed to, including different factors in the therapy, such as a child a therapist, parents, and all other factors that could impact the child's progress. This approach tries to use all the details of the child's life to work in harmony to create a balanced and all-encircling response to the problem the child enfaces. It determines a specific role for everybody in the child's life, such as a sibling, cousin, classmate, friend, grandparents, and every other tie they live into (J. Schaad, L. Dion, 2020). The approach is not straightforward as it is a system of life that concentrates on a more natural and comprehensive approach to therapeutic interaction. When SPT is performed correctly, it helps the child to co-regulate his or her internal experience, overcoming his or her challenging, uncomfortable memories, thoughts, and body sensations. L. Dion and K. Gray (2014) found out that SPT provoked significant improvement in emotionally tolerant behaviours percentage in response to trustworthy therapist expressions from the first to third sessions of SPT. SPT also had a 100% success rate in inducing emotionally tolerant behaviours by their 5^{th} session (Ibid, 2014).

4. Conclusions

Supporting children with ASD in early childhood can empower them to build vital skills that last a lifetime (K. McFarlane, 2024). The part of properly set up care for a child with ASD is the multidisciplinary cooperation of experts from the health, education and social work departments. The parent's role is crucial in managing the child's difficulties (A. Yahaya et al, 2018). The objective of therapeutic interventions for children with ASD is to support their communication, emotional development, social behaviour, sensory perception and motor skills. Music therapy, Snoezelen and play therapy can help alleviate ASD symptoms and include behavioural modification interventions, speech therapy interventions, interventions aimed at sensory processing of environmental stimuli (sensory integration).

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