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PART I MUSIC

Support of Sensory Integration and Proprioceptive Perception in a Child with Autism Spectrum Disorder Using Music in Physiotherapy

Eva Králová^a

Patrícia Shtin Baňárová^b

and Terézia Kovalová^c

ABSTRACT: Autism spectrum disorder (ASD) is characterized by core difficulties in social interaction, communication, and the presence of repetitive behaviours, among other symptoms. Music-based interventions integrated into physiotherapy may support emotional regulation in individuals with ASD. In this study, we incorporated music into the physiotherapeutic treatment of an 8-year-old boy diagnosed with ASD.

Objective: The objective of applying music in physiotherapy of the patient with ASD was stimulation of sensory integration and proprioceptive perception and supporting communication and movement activity.

Sample and methodology: The intervention consisted of three physiotherapy sessions, each lasting 40 minutes, in which music was incorporated. Pre- and post-session assessments focused on emotional regulation and movement activities relevant to autism. From a physiotherapeutic perspective, the patient with ASD exhibited predominant challenges in sensomotor integration and proprioceptive perception. At school, he experiences increased stress that negatively affects his attention and performance. Each session included 15 – 20 minutes of music therapy, with musical

^a Assistant Professor, Ph.D., “Alexander Dubček University” of Trenčín, Faculty of Healthcare, the Slovak Republic, eva.kralova@tnuni.sk;

^b Assistant professor, Ph.D., “Alexander Dubček University” of Trenčín, Faculty of Healthcare, the Slovak Republic, patricia.shtin@tnuni.sk;

^c Mgr., “Alexander Dubček University” of Trenčín, Faculty of Healthcare, the Slovak Republic, terezia.kovalova@student.tnuni.sk;

selections and activities tailored to the therapeutic objectives and planned in cooperation with the patient's mother.

Results: Improvements were observed in the patient's physical and emotional responses. During the first session, muscle relaxation in the shortened lower limb and visible signs of reassurance were noted. In the second session, increased engagement and spontaneous emotional expression were evident, particularly during decision-making and problem-solving tasks. In the third session, enhanced proprioceptive perception was observed during exercises performed on the BOSU.

Conclusion: The objective of integrating music into physiotherapy – to enhance sensory integration in a child with ASD – was successfully achieved. Across the sessions, the participant exhibited decreased muscular tension, greater engagement, and more active participation. Moreover, he demonstrated notable improvements in courage, patience, and sustained concentration during the therapeutic activities. These findings suggest that incorporating elements of music therapy into ongoing physiotherapy may be beneficial, as this combined approach appears to promote attentional control and relaxation over the long term

KEYWORDS: autistic spectrum disorder; muscle tension release; music in therapy; proprioceptive perception; stress reduction; sensory integration;

Introduction

Autism spectrum disorder (ASD) is characterized by persistent deficits in social communication and interaction, alongside restricted, repetitive patterns of behaviour, interests, or activities, which result in significant impairments in social, educational, and occupational functioning (APA, 2017).

Sensory integration: Sensory processing differences and dysfunctions are closely associated with the core characteristics of ASD (Schaaf & Mailloux, 2015). The capacity to accurately process sensory information is essential for a child's overall development and daily functioning. Children with sensory integration difficulties often struggle to generate adaptive responses to sensory stimuli, which consequently impacts their learning, motor coordination, and behaviour (Smith Myles et al., 2005). These challenges arise not from structural brain injury or loss of function but from atypical neural processing patterns (Hodges, 2020).

Difficulties in sensory modulation and discrimination are commonly observed among children with ASD and may manifest across multiple sensory domains. Such dysfunctions can be identified by professionals including physiotherapists, occupational therapists, social workers, and clinical speech and language therapists. Providing structured sensory input through targeted interventions and activities can enhance the child's ability to process sensory information and produce more adaptive responses. This, in turn, supports improvements in learning, emotional regulation, and behavioural outcomes (Bundy, Lane, & Murray, 2007).

Music therapy: The term *music therapy* (MT) is appropriately applied when musical expression serves as an essential therapeutic medium – when the intervention would lose its purpose without the use of music itself (Králová & Kantor, 2020). Music therapy engages multiple sensory modalities, allowing children with ASD to respond to stimuli in ways that are less demanding than conventional verbal communication. Through improvisation and spontaneity, children are encouraged to express emotions freely, while rhythmic activities promote improvements in motor coordination, attention, and self-regulation (Shogren, Dean, Burke et al., 2021). Music and movement activities constitute an inseparable and natural component of early childhood free play. These activities engage multiple sensory modalities simultaneously, creating a multisensory experience. From an early age, children primarily communicate through nonverbal bodily expressions, using their bodies as tools for both receiving and expressing sensory stimuli. Through bodily reactions – such as restlessness, vocalization, crying, or rhythmic movement – they externalize their sensory and emotional states. In physiotherapeutic interventions, the use of music can enhance these processes by promoting authentic bodily experiences, which are fundamental for developing self-awareness and a positive relationship with one's own physicality (Lucká & Habalová, 2022). Music has also the potential to positively influence self-image, motivation, and complex psychological states in everyday life (Kusý & Palčková, 2025).

Integrating physiotherapy with music therapy provides additional benefits for children with ASD, fostering spontaneity, emotional expression, enhanced memory, communication, and stress reduction (Reschke-Hernández, 2011). The receptive form of MT supports concentration, relaxation, emotional sharing, and the alleviation of anxiety. It often includes concurrent activities such as movement or drawing while listening to music, which allows children to remain actively engaged as recipients of musical experiences (Grocke & Moe, 2015).

Children with ASD may respond to musical stimuli verbally or through alternative forms of expression (Králová & Baňárová, 2025). In physiotherapeutic practice, MT techniques may involve musical relaxation, activation and stimulation exercises, reflective discussions about selected songs or compositions, listening to the patient's preferred music, and guided imagery based on the Helen Bonny *Guided Imagery and Music* method.

Objective

The primary objective of incorporating music in therapy, specifically in its receptive form, is to enhance sensory integration during physiotherapy for an 8-year-old patient with ASD. The intervention we used aims to improve both communication and motor perception, while also facilitating the patient's ability to express emotions through verbal and non-verbal means.

Sample – case description

A music therapy intervention was applied to an 8-year-old boy (Viktor) diagnosed with autism spectrum disorder (ASD), specifically high-functioning autism. Viktor presents with a range of characteristic symptoms, including sensory integration disorder, impaired communication and concentration, a tendency toward social withdrawal and creation of a private imaginative world, difficulties in emotional understanding and expression, anxiety in group settings, as well as impaired motor and spatial orientation and coordination. His altered sensory perception manifests particularly in the visual domain and in reduced awareness of body position, indicating a disorder of deep sensory processing. From a physiotherapeutic perspective, these findings correspond to deficits in sensory integration and proprioceptive perception. Viktor has been attending a private physiotherapy centre in Trenčín once per week for the past 18 months.

Viktor is currently enrolled in the second grade of elementary school, where he encounters increased stress that adversely affects his attention and performance. Since beginning formal education, he has struggled with work pace and handwriting tasks due to stagnation in fine motor development. He shows limited tolerance for structured instruction and often fails to complete assignments within the given timeframe. In the past two months, his mother has observed a marked decline in his concentration during activities he previously performed with ease. Writing tasks now take significantly longer to complete, and both the patient and his caregivers perceive this regression as a response to accumulated stress. Additionally, increased toe-walking has been noted, suggesting changes in proprioceptive control. The decline in sensory perception is further reflected in decreased coordination and body awareness.

Music serves as a meaningful medium for the patient, providing a vent for emotional expression and self-regulation. He can maintain focus while humming. However, this behaviour is discouraged in the school environment due to group constraints. In play, he constructs elaborate narratives that he repeatedly reenacts over extended periods, indicating fixed patterns of creative expression. Similarly, his drawing activities reveal perseverative tendencies, as he often reproduces the same image when emotionally engaged.

Methodology

The methodological approach involved a detailed description of the therapeutic sessions conducted with Viktor, integrating both physiotherapy and music therapy interventions.

Within the music therapy intervention, an individualized receptive form of therapy was applied, with a focus on enhancing sensory integration. A diverse range of musical genres was employed, including meditation music, electronic (film) music, New Age, rock, and minimalism, as well as classical music styles such as impressionism and classicism. Musical selections for specific physiotherapy exercises were selected by one of the

authors, an expert in music theory, pedagogy, and music therapy.

Physiotherapeutic techniques primarily targeted joint compression, coordination exercises for the upper and lower limbs, and activities to improve fine motor skills. These physiotherapeutic exercises were administered by the other author, a licensed physiotherapist, in conjunction with the music therapy intervention.

Planning a music therapy intervention

Three individual 40-minute sessions integrating receptive music therapy (MT) were conducted for a month and a half at a rehabilitation clinic in Trenčín, involving the physiotherapist, musician, Viktor, and his mother. Each session included 15-20 minutes of MT, with musical selections and activities tailored to therapeutic objectives and planned in collaboration with his mother.

Both creative and non-creative receptive MT approaches were applied. Non-creative MT focused on relaxation, stress reduction, muscle tension release, and enhanced body awareness. Creative MT supported fine motor development (drawing or sorting Lego bricks to music), emotional expression (clapping, slapping, snapping), balance and coordination (for example ball exercises while standing on BOSU), and guided breathing exercises.

Activation exercises using reproduced music targeted sensory integration, attention, concentration, spontaneity, emotional expression, and motor coordination. Interventions were adapted to the patient's emotional state, and technical conditions ensured high-quality auditory stimuli. The long-term plan included educating the mother on strategies to further develop sensory integration through music.

Therapeutic setting for music therapy

The music therapy intervention was conducted in a children's room at a private rehabilitation clinic in Trenčín, equipped with rehabilitation and sensory aids. Viktor was familiar with the environment and responded positively. Therapy utilized familiar equipment that he typically requests during exercises, including a BOSU, fitball, ball, and toys such as Lego blocks, coloured cubes, and containers. The auditory environment was carefully controlled, with music played at a maximum of 50 decibels – comparable to normal indoor ambient noise, muffled conversation, or typical street sounds – ensuring comfort and safety for his sensory perception.

Implementation and results

This section presents the implementation of three music therapy interventions, detailing the therapeutic objectives, selected musical stimuli, physiotherapy techniques, and observed outcomes. The objectives for each session were determined according to the patient's emotional state at the time of the intervention, allowing for an individualized and responsive therapeutic approach.

Session 1

Activity 1: The objective of this activity was to induce relaxation, release tension in the shortened lower limb muscles, and enhance body awareness through joint pressure techniques. Viktor did activities while he was listening to 2 slow-tempo musical pieces:

1. *8D Bilateral EMDR – Sound Energy Alchemist* (4:18 min, lento, 50 BPM), meditation music.
2. *Song of White – Theme* (2022), Vangelis, *Antarctica* (4:50 min, adagio, 56 BPM), New Age, electronic music.

Procedure: During the first piece, Viktor lay supine with eyes closed, attending to musical elements reminiscent of natural sounds, such as rustling leaves. Within approximately two minutes, he achieved a calm state. Physiotherapy then commenced, incorporating passive release of the shortened lower limb muscles combined with joint pressure to enhance proprioceptive awareness (Figure 1A). Passive muscle stretching techniques were applied concurrently with the second Vangelis piece. The entire activity lasted 10 minutes

Activity 2: The objective of this activity was to enhance fine motor skills, hand-eye coordination, concentration, and patience, while supporting the sensory integration of auditory and visual stimuli. The activity, Music and Colours, also encouraged emotional expression through the selection of colour shades and promoted creativity by linking musical perception with visual representation. Materials included coloured markers and large drawing paper. Slow, expressive piano compositions were used during the activity:

3. *Moonlight* (1905), Claude Debussy, *Suite bergamasque* (5:02 min, andante, 63 BPM), impressionism.
4. *Moonlight Sonata* (1801), Ludwig van Beethoven, Piano Sonata No. 14 in C-sharp minor *Quasi una fantasia*, 1st movement (5:04 min, adagio sostenuto, 56 BPM), classicism.

Procedure: Both pieces were piano compositions; therefore, the session began with a brief introduction to a pianist and the expressive potential of musical performance. Viktor observed a photo of the pianist while watching a short online demonstration of the pianist's interpretation. This was followed by hand and finger exercises simulating piano playing and raindrop movements. He was encouraged to choose colours and expressive gestures according to his mood and personal associations with the music.

During the musical pieces, Viktor sat at a table with markers and paper ready. After listening to the first piece, he spontaneously drew a piano and the pianist, demonstrating persistence and careful attention to detail. He maintained concentration without vocalizing or humming along and engaged in imaginative visualization of lights while

drawing. The second piece, *Moonlight Sonata*, followed, and Viktor completed his artwork within approximately 10 minutes (Figure 1B and 1C).



Figure 1. Course of the first therapeutic session

Legend: 1A - Relaxation of shortened lower limb muscles with joint pressure applied to enhance proprioceptive awareness; 1B - Activity "Music and Colours" during the drawing process, illustrating engagement with auditory and visual stimuli; 1C - Outcome of the "Music and Colours" activity, showing the Viktor's expressive response and creative output.

Session 1 - results: At the start of the session, Viktor exhibited signs of nervousness. After approximately two minutes of exposure to a calm tempo and pleasant musical melodies, he achieved a relaxed state. Muscle tension in the lower limbs was notably reduced, and he demonstrated awareness of joint position even in extended postures.

During the subsequent "*Music and Colours*" activity, Viktor displayed positive affect, including smiling, despite typical challenges in communication and social interaction. According to his mother, drawing serves as a primary means of emotional expression and therapeutic processing. Viktor engaged attentively with the task, independently selecting colours for the piano, the figure of the pianist, and visual representations of the music, expressing satisfaction with the developing artwork. The drawing process progressed sequentially, beginning with the piano, followed by the figure, and concluding with symbolic depiction of the musical phrases as "waves."

Viktor demonstrated persistence and autonomy throughout the activity. His mother noted that he had not previously completed a comparable drawing independently, highlighting the significance of this therapeutic outcome. The session concluded with Viktor giving the completed artwork to his mother, reflecting a sense of pride and accomplishment.

Session 2

Activity 3: The objective of this activity was to facilitate synchronization between

the Viktor's movements and the rhythmic structure of the musical recording, while simultaneously enhancing attention, planning, and rhythmic motor coordination through targeted body percussion. This activity was selected for its potential to promote sensory integration, concentration, perceptual processing, and emotional expression through rhythmic movement. During the therapeutic session, a "rhythm and tempo game" was implemented, in which Viktor executed planned body taps in synchrony with the musical rhythm while nonverbally expressing their current emotional state. Through listening and repetition of rhythmic sequences, the intervention aimed to strengthen attention, working memory, and motor planning skills, particularly in executing coordinated actions such as thigh slapping and hand clapping. These exercises also contributed to improving upper limb coordination. The session employed rhythmic music characterized by a fast tempo:

5. *Clapping Music* (1987) by Steve Reich, from the album *Early Works* (duration: 4:49 min; tempo: vivace, 172 BPM). Genre: minimalism; style: experimental and rhythmic composition.

Procedure: At the beginning of the activity, the participant was guided to adopt a correct seated posture on a raised mat. He then imitated the therapist's movements in a body percussion exercise involving rhythmic slapping of the thighs. The participant appeared engaged and expressed enjoyment, consistent with his reported preference for clapping, drumming, and similar rhythmic activities. The body percussion task consisted of alternating rhythmic patterns: initially, the right hand striking the right thigh and the left hand striking the left thigh, followed by a crossed pattern in which the right hand struck the left thigh and the left hand struck the right thigh (Figure 2A). Subsequently, the participant remained seated on the mat and listened to a demonstration of *Clapping Music* by Steve Reich, after which he began to reproduce the rhythmic pattern by slapping his thighs (Figure 2B). Initially, he followed the therapist's model and later continued independently until the completion of the musical excerpt. During the rhythmic-motor engagement, he displayed positive affect, smiling and gently swaying his torso laterally in time with the music. The total duration of the activity was approximately six minutes.

Activity 4: The objective of this activity was to enhance sensory and proprioceptive perception. The participant engaged in synchronous activation of the abdominal and back muscles while performing coordinated movements that integrated multiple sensory modalities. During the "colour sorting" task, the participant was required to focus on several stimuli simultaneously, combining visual and manual colour categorization with a concurrent musical accompaniment. The activity also incorporated elements of decision-making training, encouraging the participant to select and organize coloured objects based on auditory and visual cues. The exercise was performed while seated on a gymnastic ball, which provided continuous proprioceptive stimulation through dynamic balance control. The therapeutic session utilized fast-paced rock music to support

rhythmic engagement and motor activation. During this activity we used the following musical material:

6. *Holly Herald* (2009) by Jethro Tull, from the album *Christmas Album* (duration: 4:17 min; tempo: allegretto – moderately fast, 113 BPM). Genre: rock; style: progressive and folk rock.

Procedure: The participant assumed a prone position on a gymnastic ball, with his head oriented downward toward the floor. Initially, he touched the ground with his thumbs and then raised his arms, practicing body extension and balance control. Subsequently, a sensory mat, six coloured bowls (yellow, orange, red, green, blue, and purple), and 24 Lego bricks (four pieces of each colour) were arranged on the carpet in front of him. After receiving instructions regarding safe movement and balance on the gymnastic ball, the participant propelled himself forward to the sensory mat in coordination with the musical accompaniment. Upon reaching the mat, he placed both hands on its surface while maintaining trunk support on the gymnastic ball and keeping his lower limbs relaxed, thereby ensuring postural stability.

The task required him to sort and place the Lego bricks into bowls of corresponding colours (Figure 2C). He experienced minor difficulty distinguishing between similar hues (yellow and orange) and hesitated when determining colour placement. To resolve this, he grouped visually similar bricks together and subsequently selected the most appropriate colour match. Throughout the activity, he actively decided which hand to use for grasping and sorting, thereby engaging both visual discrimination and proprioceptive coordination. At the participant's request, the activity was repeated three times. The total duration of the session was approximately 15 minutes.

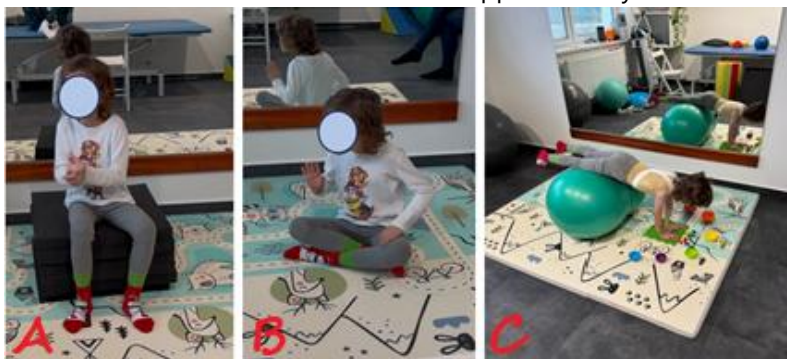


Figure 2. Course of the second therapeutic session

Legend: 2A – “Rhythm game” activity performed in a seated position on a raised mat;
 2B – “Rhythm game” activity performed in a seated position on the floor;
 2C – “Colour sorting” activity.

Session 2 - results: During the activity “Playing to the rhythm,” the participant demonstrated evident joy and enthusiasm. He smiled frequently and synchronized the

movements of his torso and head with the musical rhythm. A slight deceleration in movement was observed when alternating cross-lateral hand patterns (left hand to right thigh, right hand to left thigh). The participant also expressed enjoyment of the “Colour sorting” activity, including the accompanying musical demonstration, and stated that he wished to repeat it at home. Throughout the session, he exhibited patience, sustained motivation, and active engagement in the therapeutic tasks.

Session 3

Activity 5: The objective of this activity was to develop balance control, strengthen core stability, and improve coordination between the upper and lower limbs. The therapeutic session employed electronic music with a slow, steady walking tempo to support rhythmic motor engagement. The following musical material was used:

7. *Main Theme* by Vangelis, from the album *Chariots of Fire* (duration: 5:27 min; tempo: andante – moderately slow, 95 BPM). Genre: film electronic music.

Procedure: During the activity, the participant stood upright on BOSU with knees slightly flexed and feet positioned shoulder-width apart. A ball was thrown toward him, which he caught and returned to the therapist. Initially, the throws were directed straight toward his hands; later, the ball was thrown laterally and rolled along the floor, prompting the participant to adjust his posture and squat on the BOSU to retrieve it. This variation stimulated proprioceptive and visual-sensory feedback; and engaged visual-motor coordination, enhancing both hand – eye and bilateral hand coordination (Figure 3A).

The activity required sustained attention, as the direction of each throw was unpredictable. The accompanying musical background added a dynamic and motivational component to the task. Compared with previous sessions, the participant demonstrated increased patience, confidence, and persistence. The total duration of the activity was approximately 15 minutes.

Activity 6: The objective of this activity was to promote relaxation following the preceding balance exercise in BOSU workout, using guided breathing and rhythmic-motor relaxation techniques. Electronic music with a medium-slow tempo was incorporated to facilitate calmness and steady breathing. We used the following musical material:

8. *Song of the Seas* by Vangelis, from the album *Song of the Seas* (duration: 5:34 min; tempo: andante – steady and free, 70 BPM). Genre: electronic music.

9. *Crab Breaths* – Namasteln school, motivational video on breathing exercises.

Procedure: To induce relaxation, the “Playing a crab” exercise was employed. The participant sat comfortably on a mat, listened to the musical background, and imitated crab-like movements synchronized with a structured breathing pattern. The breathing sequence involved inhaling through the nose (count 1-2-3), holding the breath (count 1-2-3-4-5) while simultaneously performing five “claw-clicking” hand movements, and

exhaling slowly through pursed lips (count 1-2-3-4-5-6-7). During exhalation, the participant performed gentle side-to-side movements of the head and torso, referred to as the “crab dance” (Figure 3B). The therapist participated alongside the participant, modelling the breathing rhythm and movements to encourage engagement and synchronization.



Figure 3. Course of the third therapeutic session

Legend: 3A – “Coordination game on a BOSU ball” activity;

3B – “Crab Walk” activity.

Session 3 – results: Although BOSU workout was not new to the participant, this session marked the first occasion during which such activities were accompanied by music. The introduction of musical accompaniment appeared to have a positive influence on his engagement. He demonstrated greater confidence, patience, and overall enthusiasm during the session. During the balance task, the participant became strongly attuned to the rhythm of the music and momentarily lost concentration, resulting in a brief loss of balance and a fall from the surface of BOSU. He was not alarmed by the incident and promptly resumed the activity, maintaining motivation and focus.

The subsequent relaxation activity was intentionally designed to follow the physically engaging BOSU workout. Based on prior therapeutic experience with the participant, it was known that relaxation is most effectively achieved when the exercise is embedded within a short imaginative narrative, such as the “Playing a crab” activity. The background music created a calm and pleasant atmosphere, to which the participant responded with slow, rhythmic swaying of the torso. Throughout the exercise, he maintained concentration on the breathing sequence – inhale, hold, and exhale – accompanied by the coordinated “claw-clicking” hand movements.

Summary of Results

Following three sessions of music-supported physiotherapy, the observed effects in an 8-year-old patient with autism spectrum disorder (ASD) were as follows:

Session 1: The participant exhibited relaxation and reduced tension in the shortened muscles of the lower limbs. While engaging in drawing activities accompanied by music, he demonstrated persistence, concentration, and positive affect.

Session 2: During rhythmic clapping exercises, the participant expressed joy and enthusiasm, smiling and moving his torso and head in synchrony with the rhythm. In the colour-sorting task, he demonstrated independent decision-making, hand alternation, and self-directed problem solving.

Session 3: The participant displayed patience and confidence during balance and coordination exercises in BOSU workout. During the subsequent relaxation activity, he responded with slow, controlled swaying of the torso and maintained focused attention.

The main objective of the music intervention – supporting sensory integration in a patient with ASD – was achieved. The participant demonstrated the ability to induce a state of physical and psychological well-being, which was reflected in muscular relaxation and enhanced engagement during therapeutic exercises.

Conclusion

Impaired sensory perception in the 8-year-old participant with ASD was primarily observed in the visual domain and in reduced awareness of body position. To address these challenges, proprioceptive stimulation was incorporated through joint pressure exercises and activities performed on an unstable surface of BOSU. With parental consent, three physiotherapy sessions incorporating a music-based intervention were designed to support sensory integration.

Musical selections and therapeutic activities were tailored to the specific objectives of the intervention. An individualized receptive form of music therapy was employed, focusing on enhancing sensory integration in the child. Throughout the sessions, the participant demonstrated reduced muscular tension, increased engagement, and active participation. Notably, he exhibited courage, patience, and sustained concentration during the exercises.

Based on these observations, the integration of music therapy elements into ongoing physiotherapy was recommended, as this approach appears to facilitate both attentional control and relaxation in the long term.

References

- APA – American Psychological Association. Diagnostic and Statistical Manual of Mental Disorders – DSM-5 (5th ed.), (2017), American Psychiatric Publishing; Arlington, VA, USA.
- Bundy, A. C., Lane S. J., Murray E. A., (2007), *Sensorische Integrationstherapie – Theorie und Praxis*, Heidelberg: Springer, 3rd edition.
- Grocke, D., Moe, T., (2015), *Guided Imagery & Music (GIM) and Music Imagery Methods for Individual and Group Therapy*, London: Jessica Kingsley Publishers.

- Lucká, Z. F., Habalová, M., (2022), Music and movement activities in support of sensory processing, Proceedings of INTCESS 2022- 9th International Conference on Education & Education of Social Sciences 17-18 January 2022- Online Conference.
- Hodges, D. A., (2020), Music in human experience: An introduction to music psychology, Taylor & Francis.
- Králová, E., Kantor, J., (2020), Hudobná terapia v rámci fyzioterapie, Vysokoškolská učebnica pre študijný odbor Zdravotníckej vedy, ed. Trenčianska univerzita Alexandra Dubčeka v Trenčíne, 1st edition.
- Králová, E., Shtin Baňárová, P., (2025), Application of music therapy, play therapy and Snoezelen in children with autism spectrum disorder. Review of artistic education, Artes Publishing House – “George Enescu” National University of Arts, Iași, Romania, vol. 29, pp. 1-14.
- Kusý, P., Palčeková, A., (2025), The potential of music-based interventions as a component of social rehabilitation, Rehabilitácia, LIEČREH, s.r.o. Bratislava - Lamač, vol. 62, no. 3, 2025, 162-181
- Reschke-Hernández, A. E., (2011), History of music therapy treatment interventions for children with autism. Journal of Music Therapy. 2011, vol. 48 (2), pp. 169-207.
- Shogren, K. A., Dean, E. E., Burke, K. M. et.al., (2021), Goal Attainment Scaling: A Framework for Research and Practice in the Intellectual and Developmental Disabilities Field. Intellect Dev Disabil, vol. 59 (1), pp. 7-21.
- Schaaf, R. C., Mailloux, Z., (2015), Clinician's Guide for Implementing Ayres Sensory Integration®: Promoting Participation for Children with Autism. American Occupational Therapy Association.
- Smith Myles, B. et al., (2005), Asperger Syndrome and Sensory Issues. Practical Solutions for Making Sense of the World. Kansas: Autism Asperger Publishing Co.
- Discography
- Ludwig van Beethoven, (1801), Moonlight Sonata no. 14 Quasi una fantasia; 5:04 min, tempo: adagio sostenuto 56 BPM, music genre: Classicism. CD Mondschein Sonata. Daniela Varínska. 1996. Piano Sonatas Vol. 1. Opus-91.
- Claude DEBUSSY, (1905), Moonlight. 5:02 min, tempo: andantino 69 BPM, music genre: Impressionism. CD Suite bergamasque. 1988. L. 75: no. 3. © A Warner Classics release.
- Jethro Tull 4, (2009), Holly Herald. 4:17 min, tempo allegretto 113 BPM, music genre: rock, music genre: folk rock, progressive rock. CD: Christmas Album.
- Namasteln School, (2022), Crab Breaths | Mindful Breathing Exercises for Kids | Calm Summer Meditation Music.
- Steve Reich, (1987), Clapping Music. 3:39 min, tempo vivace 172 BPM, music genre: Minimalism, experimental and rhythmic music. CD: Early works by Steve Reich. Ed. Steve Reich a Judith Sherman. Label: Elektra Nonesuch.
- Sound Energy Alchemist, (2024), 8D Bilateral EMDR ThetaDreamscape. 4:18 min, tempo: lento 50 BPM, music genre: meditation music.
- Vangelis – Evangelos Odysseas Papathanassiou, (2022), Song of White – theme; 4:50, music genre: New Age, electronic music, tempo: adagio 56 BPM. CD Anctartica. © 2016 Universal Music International.
- Vangelis – Evangelos Odysseas Papathanassiou, (1981), Main Theme, 5:27 min, tempo: andante 95 BPM, music genre: Electronic music. CD Chariots of Fire.
- Vangelis – Evangelos Odysseas Papathanassiou, (1996), Song of the Seas, 5:34 min, tempo: andante, 76 BPM, music genre: New Age, electronic music, ambient. CD Song of the Seas