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EDITOR  
PROF. DR. ŐEHRİBAN KOCA

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# Chapter 4

## MUSIC THERAPY FOR CHILDREN WITH SPECIAL EDUCATIONAL NEEDS

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## **Introduction**

Music therapy is a modern profession that needs skills and theoretical knowledge. Although music therapy as a profession that has only recently been established, the link between music and therapy is not new. Historical data have repeatedly explained the human preoccupation with music as part of healing, and this can be found throughout history, myths, legends, and literature of the last 2000 years. From this we can say that music presumably existed as a way of healing even in the earliest primitive societies (Bunt et al., 2013).

It seems appropriate to start speculating why music can be a healing tool around the world and why music “in many periods and cultures in the past two and a half millennia, probably even before, was a cure” (Horden, 2017). Contemporary research in child psychology and psychobiology suggests the existence of innate musicality (Malloch & Trevarthen, 2018). Innate musicality has a vital function from the moment we are born, when we use sound as our earliest means of communication. The sounds that a child can make at any time have pitch, color of sound, melody, intensity and rhythm. Furthermore, these sounds express feelings such as hunger, happiness, need for sleep, etc. The child uses these sounds to communicate and if everything goes well in a developmental order, he eventually learns to speak, the sounds grow and transform into speech. The parent is likewise able to communicate with the child instinctively (Tolbert, 2001). This intuitive manipulation of musical sound is called “Communicative musicality”, and the term refers to “those attributes of human communication that are particularly exploited in music and that are vital for the communication between the parent and the child”. Research shows that the lack of opportunity for this early communication can have a profound effect on a child’s emotional and cognitive development (Trevarthen, & Malloch, 2018).

## **History of music therapy**

The idea of the healing positive effect of music on health and behavior is at least as old as Aristotle and Plato, noting such observations in their writings. In the 20th century this discipline began to develop after the First and Second World Wars when all kinds of social (state) musicians, professionals and amateurs, have been engaged in hospitals where thousands of soldiers have been physically injured or emotionally traumatized by the war (Horden, 2017). The positive outcomes of this activity, in terms of the psycho-physical condition of the patients, forced the doctors and nurses to the idea of constantly hiring musicians within the hospitals, which of course first needed to have proper training. Shortly afterwards, the need arose to create studies for the profession of music therapist, and the first

undergraduate program appeared at Michigan State University in 1944 (Davis & Hadley, 2015).

### **What is music therapy?**

The World Federation of Music Therapy defines music therapy as follows: “Music therapy is the use of music and/ or musical elements (sound, rhythm, melody and harmony) by a qualified music therapist with a individual or group, in a process designed to facilitate or promote communication, connections, learning, movement, expression, organization and other important topics of therapy to meet the physical, emotional, mental, social, and cognitive needs. Music therapy goals are aimed at developing the potentials and/ or restoring the functions of the individual so that he/ she can achieve better intra or interpersonal integration and thus a better quality of life through prevention, rehabilitation or treatment” (Haase, 2012). This definition is necessarily broader in order to cover the many different models and methods of practice that exist around the world. There are generally two main approaches to music therapy: receptive and active. The receptive approach is based on listening to music, while the active approach consists of improvising, playing, singing or composing your own music (Bell, 2017). In the international music therapy community two different applications of music as therapy can be found (Sutton, 2002):

- The use of music because of its inherent preservative and therapeutic qualities and
- The use of music as a means of self-expression and interaction within a therapeutic relationship.

Bunt (2003) point out three different sources of emotion that arise in music therapy. Music can trigger a wide range of associations and associative connections to specific events, places, memories and people that matter in a child’s life. The second type of emotion is iconic connections, when the child associates’ musical characteristics with some external musical event or human emotion (for example, a child names the music he or she listens to as a “sunny day” because it sounds like that). The third type of emotion is intrinsic connections, when the child’s emotional experiences are linked to different aspects of the music. Music helps the children to recognize and express their emotions (Flower, & Oldfield, 2008).

Music therapy can be performed directly with the child or in consultation. Direct work sessions usually last 30, 45 or 60 minutes, and before starting the whole process, data are taken from parents or caregivers, in order to understand and accurately set goals. When taking the anamnestic data, the therapist receives information about the child’s favorite music and activities, and each therapy session is created in accordance with



the specific needs and abilities of the child. Music therapy consultations consist of strategies, resources, music and materials for teachers, parents, therapists and other profiles working with children or young people who may benefit from music therapy (Silverman, 2007).

### **Mechanisms of action of music on children**

Music causes a certain vibration in people, which means a mental reaction. The basis of music is sound - a sound signal, which has a wave structure. It is known from the literature that an acoustic signal affects the cells of a living organism, changing their activity. Sound has the effect of several parameters (Skille, & Wigram, 1995):

1. The electromagnetic conductivity of cellular structures, as well as their electrochemical activity - this is called the “non-specific acoustic-bioresonant effect”, one of the reactions of the human body to musical, sound effects;

2. At the auditory reception, perception. The perception of music is done mainly through the auditory system. Analyzes in the literature concerning auditory, and thus musical perception, go back through the history of the indisputable fact that hearing originally served as an orientation tool, which, informing about the state of the outside world, emotionally adjusts the person to different external impacts. Every sound for the ancient person is primarily semantic: it carries information about the “intentions” of the object in relation to a person - whether there is thunder, murmurs, bangs in the dark, sounds of mountain shocks. It provokes a response, stimulates a response in the person that is directed by his immediate emotional reaction to sound information.

3. On vibrotactile perception. Vibrotactic perception is based on the work of a tactile analyzer. It registers various vibrations, including those arising during the music-therapeutic effect. Together with other analyzer systems, it helps the body navigate in the environment.

### **Music and body reactions**

The auditory, vibrotactic perception, as well as the bioresonance effect, is accompanied in the human body by numerous reactions at the body level (Çolak et al., 2021). With active perception of music, a person’s physiological rhythms resonate and involuntarily adapt to its frequency and dynamic indicators. “It has been shown that musical tempo, rhythm, structure of a work and other musical factors can subordinate the rhythm of internal physiological processes” (London, 2012). One of the reasons for the physiological effect of music on a person is that the nervous system, and thus the muscles, have the ability to assimilate rhythm. Music, as a rhythmic stimulus, stimulates the physiological processes of the body

that occur rhythmically in both the motor and vegetative spheres. Many vegetative reactions of our body to music are known (Galińska, 2015). The cardiovascular system responds significantly to music, with pleasant relaxing music that evokes pleasure and creates a pleasant mood, the pulse slows down, heart contractions intensify, blood pressure decreases, blood vessels dilate. With irritating music, the heartbeat becomes faster, blood pressure rises, general tension is felt (Da Silva et al., 2014). Campbell (2000) points out that music stimulation reduces motor reaction time, increases the lability of the visual analyzer, improves memory and sense of time, revives the condition of reflexes.

Music has an effect on cholesterol. By slowing down the tempo of a piece of music or listening to slower music, we can deepen and slow down our breathing and allow our brain to calm down. Deeper, slower breathing rhythms are optimal, promote peace, control emotions, deeper thinking and better metabolism. Rapid, confused breathing can lead to superficial and distracted thinking, impulsive behavior, and a tendency to make mistakes (Stevens, 2012). Music also affects hormonal metabolism. It “regulates the release of stress-reducing hormones ... the level of stress hormones in the blood is significantly reduced in those who regularly listen to relaxing, calm music.” Musical pleasure - the uplifting sensation caused by listening to certain music - is the result of the release of endorphins - “own opium”. Endorphins are produced by our brain. Relieves pain and causes natural growth (Yamasaki et al., 2012). The well-known music therapist and scientific researcher in the field of the impact of music on the human body S.V. Shusharjan (2005) notes in his works that the waves created by the brain can be changed with the help of music and expressive sounds. Consciousness consists of beta waves vibrating at a frequency of 14 to 20 hertz. Beta-waves are generated by our brain when we are focused on daily activities or experience strong negative emotions. Elevated sensations and peace are characterized by alpha waves extending from 8 to 13 Hz. Periods of peak creativity, meditation and sleep are characterized by theta waves with a frequency of 4 to 7 hertz. Both deep sleep, deep meditation and unconsciousness create delta waves, with a frequency of 0.5 to 3 hertz. The slower the brain, the more relaxed and calm we feel. With the help of music, you can transfer awareness from the beta waves to the alpha range, thereby increasing your overall well-being and attention. Playing music can create a dynamic balance between the more logical left and the more intuitive right hemisphere.

Music also causes various motor reactions in the body. When a child listens to music, he develops real muscle pulsations in several areas: the muscles of the arms, legs, head, torso and larynx. For example, music with a pronounced rhythmic beginning causes involuntary shaking of the

hands, clapping of the feet or shaking of the head. Children who learn to play different musical instruments unconsciously begin to reproduce the musical pattern of their movements. The rhythm of the music encourages the children to move. Music also causes unconscious micro-movements of the ligaments of the vocal apparatus, when listening to music we unconsciously reproduce it internally (in ourselves) (McGuinness & Overy, 2011).

### **Exercise for implementing music therapy with children with special educational needs**

This technique can be used as a tool for developing valuable social qualities - patience, attention, increasing self-confidence, etc. Used in group, individual and family work. Children may have minimal skills in playing musical instruments and sound objects, or they may be performing this type of activity for the first time (Kern, 2018).

**Preparatory phase.** Children are invited to sit nearby, preferably in a circle. The therapist offers users to play with any musical instrument or object they like, with which they can create sound. It is then suggested that they play together, helping each other to create a combination of sounds, a musical phrase or just to continue the fragment started by the previous participant. The therapist may also suggest the use of any other tool or object that the child likes in the game. It is important that the child behaves spontaneously. An environment that encourages the child to express himself freely, should be created. The classroom should have a sufficient number of musical instruments and objects that can create sounds, they should be accessible and interesting (Stouffer et al., 2007).

**Second phase.** The therapist asks the child (or one of the members of the group) to make a lot of sounds with his instrument, to play “his melody”. If it is difficult for children to start exercising, then the therapist starts first. The closest participant, based on their own ideas, tries to continue with the voice dial. Its composition does not have to be long, so all children have time to participate several times (Kern, 2018).

**The third phase.** The whole process of creating musical improvisations is recorded on tape. When the children feel that they have nothing more to add, the therapist invites them to listen to the recording with the result of their joint work. The therapist gives a positive assessment of the children’s creativity, says something good about the creativity process and invites the children to discuss their musical work. After that, the children listen to the recording again. The main points of discussion are (Lu, 2017):

- 1) which tools were used most often;

- 2) what can be said about the sounds that prevail in improvisation, how can they be described;
- 3) what other sound combinations were remembered;
- 4) is it possible to hear a melody, did the music turned out to be beautiful;
- 5) what, in their opinion, expresses the music they created;
- 6) does the music reflect the life of the children, their relationships;
- 7) what each child brings to the collective creativity;
- 8) how his instrument sounded;
- 9) how his music influenced the course and the result of the overall work.

**The fourth stage.** It is used as an alternative to the previous one or as a supplement. The therapist asks the child or one of the members of the group what might happen in their piece of music, what is its content. Or what can accompany this music, what can happen in its background, what their music looks like. He suggests that children on this basis will come up with a story, to compose a musical story that would express the recorded children's music. The children in turn compose a fairy tale, passing the "conductors baton" in a circle (Goodman, 2011).

**Option:** Children compose words to a song that can be sung in their music. The whole process is recorded on tape. In the next lesson, the children listen to the recorded musical fairy tale, songs, discuss it. The therapist complements, plays other musical instruments, composes other words, or corrects old ones (Lu, 2017).

## **TYPES OF MUSIC THERAPY**

### **Vibroacoustic therapy**

In past civilizations and in various cultures the vibration of sounds or individual tones has been used as a means of intervening physical disability and pain, as well as psychosomatic disorders (Wigram, 1996). The modern version of this treatment, was specially developed in the 1960s in Scandinavia and Britain and it includes the physiological effects of musical vibrations on the body. In Norway it is initially known as "music bath" and soon as vibroacoustic therapy. Skille and Wigram (1995) write about this: "The music bath tries to create an environment where the body" bathes" in sounds and vibrations". The equipment (patented worldwide) consists of a bed/ bench or chair with several built-in speakers. This is connected to a six-channel signal unit containing a CD player that can play a variety of music.

In the vibroacoustic therapy process the child with special educational needs lies on the bed so that the sound is transmitted through the air directly to his body. Examples of conditions where this therapy has been shown to be effective are: asthma, cerebral palsy, constipation, abdominal pain, sports injuries and insomnia (Skille and Wigram, 1995).

### **Use of recorded music as an adjunct in the treatment of physical illness**

Music therapy techniques in the United States, are being developed to record pain relief or reduce anxiety, pain, or stress so that the patient needs less medications (Standley, 1995). The procedure implicates listening to music that the patient has previously selected on high-quality equipment, during treatment or directly before treatment. Where possible the patient has control over how loud the music is and turns the music on and off. This type of music therapy takes part in many medical procedures, including surgery, where it is used “before surgery to reduce anxiety and the amount of anesthesia needed” (Standley and Hanser, 1995). Patients, including those undergoing renal dialysis, where music is used to reduce discomfort and is a distraction, and some even use it in childbirth. Other patients in Standley’s (2012) research on passive music listening shows that music is used to reduce pain and increase the analgesic effect of drugs for those suffering from cancer. Passive listening to music is also used in the treatment of premature and ill children, where music is used to gain weight and reduce time spent in hospital.

### **Guided imagery with music (GIM)**

This “profound psychotherapeutic method” (Goldberg, 1995) of music therapy was initially developed in the 1960s by Helen Bonnie, she has been working at the Maryland Psychiatric Research Center in the United States as a music therapist, conducting experimental psychotherapy with patients with malignant disease in last stage and alcohol addicts. In the first forms of work, the patients themselves were treated with LCD due to their condition, which was banned in 1972, so Helen Bonnie developed a new modified model of music therapy without the use of narcotics.

In her research, Bonnie found that when subjects listened carefully to a program of recorded classical music while in a relaxed phase, symbolic images and powerful feelings have been evoked, which has led to a significant insight into the treated problems (Goldberg, 1995). According to the research findings, the new GIM model uses two components: altered state of consciousness and consists of a four-phase session and a series of music programs.

The stages of the treatment are:

- **Introduction:** lasts about 15-20 minutes, the therapist tries to divert the patient's attention from the outside world to his inside, to the problems, and the focus point of the session must be determined in advance. The child is usually placed in a relaxed supine position with their eyes closed, in a specially adapted room. The therapist constantly keeps notes on the overall conversation, the patients behavior, body movements, etc.

- **Induction, relaxation and focus:** lasts 2 to 7 minutes, the therapist separates and writes sequences (elements) from the patients story or focuses on a deeper emotional level (e.g., the child gives a detailed description of the feelings he had during the day) . The purpose of induction is to enable easier diversion to deeper levels of consciousness and greater flexibility in experiencing time and space.

- **Music journey:** the therapist leads the patient, in the first sessions and in a more directive way. During the musical journey, the therapist is a faithful companion of the patient, sharing the patients' imaginations, while trying to understand the inner experiences of different modalities: auditory, visual, gustatory, tactile, olfactory. Emotions and memories are also involved in the imagination. The patient's imagination can be clear or diffuse, slowly changing or fast, personal, unrelated or coherent. The musical journey takes 30 to 50 minutes.

- **Going back:** this phase begins with the end of the music and lasts 10-20 min, the therapist slowly returns the patient back to the normal stage of consciousness, while discussing the connection of daily emotions with the problem being treated (Abrams, 2000).

The therapist chooses the program of the recorded music for each session, making it depending on the patients' medical history as well as their current mood (Goldberg, 1995). Today there are more than 30 specific music programs released on 10 CDs called "Music for Imagination". The programs last 30 to 50 minutes and consist of 3 to 8 long or short sequences of classical music, instrumental and vocal. The method has been successfully applied to groups of patients of different types, especially those with specific clinical needs, who can use it as a means of self-research and fulfillment. Practicing the method requires monitoring and special training, after qualifying as a music therapist (Klempe, 2018).

### **Improvisational music therapy**

In improvisational music therapy, improvised live music is used as a medium of communication between patients and therapists. Improvised music therapy is actually based on active, spontaneous music creation. Making music spontaneously means that there are no set rules for how or

what to play. Patients do not need to be musical or have a music education to practice improvised music therapy. It is more about playing and exploring sounds and expressing movements, thoughts, ideas through music. The method uses non-verbal and verbal expression while enabling confrontation of emotions, development of creativity, flexibility, spontaneity (Bruscia, 1998).

The model has been originally developed for adults with emotional or interpersonal problems, and today the practice of music therapy in Britain and around the world is mostly based on the benefits of improvised music (Wigram, 1996).

### **(Nordoff-Robbins) Creative music therapy**

The American composer-pianist Paul Nordoff and the British special educator Clive Robbins have worked together for almost two decades to explore the place of music in therapy, especially by showing interest in children with disabilities. They had pilot projects with children with autism, intellectual disability, emotional disorders, disharmonious development and developmental delays and other learning difficulties, using music as a means of therapy. Their approach is based on the claim that anyone can find meaning or benefit from music and focuses on creating music with the help of a therapist (Tyler, 2017).

In the individual treatment the patient is offered a limited number of instruments, usually a drum or cymbals and more emphasis is placed on the vocal expression, while in group work percussion percussions, horns, etc. are added. The therapist usually sets a musical framework, usually determines the rhythm and pulse, and tries to maintain the child's musical expression within that framework (Nordoff and Robins, 1977).

### **Kodaly music therapy**

Zoltán Kodály is considered to be the inspiration for the development of the eponymous type of music therapy. It is based on the application of rhythm, notation (working with notes), sequences and movement as tools for learning or healing the patient. Case studies have shown that this method helps to improve intonation, rhythm and musical expression, and has a positive effect on perceptual functions, conceptual formation, motor skills and the ability to learn (Houlahan, and Tacka, 2019).

### **Neurological Music Therapy (NMT)**

This model is based on neuroscience, more specifically on the perception and production (creation) of music and their impact on brain function and behavior (Çolak et al., 2020). NMT is actually a system of 20 standardized clinical techniques for sensorimotor training, language and

speech training and cognitive skills training. This method is commonly used in patients with traumatic brain injury, stroke, Alzheimer's disease, Parkinson's disease, cerebral palsy, autism, and other neurological diseases that affect communication, movement, and cognition, (Thaut, 2015).

Neurological music therapy involves several types of different techniques:

- **Rhythmic auditory stimulation:** a technique used to aid the rehabilitation of movements that are fundamentally biologically rhythmic, especially gait. The physiological effect of auditory rhythm on the motor system is used to improve movement control (Thaut 2015).

- **Sensory amplification:** is a technique that uses the harmonic, melodic, rhythmic, and dynamic-acoustic elements of music to provide temporal and spatial signals (symbols) for movement, which reflect the functional activities of everyday life. The application of this technique is wider than the previous one, because it is also applied to movements that are not innately rhythmic (e.g. movement of arms, sitting-getting up). In fact, a musical model is used to encourage simple, discreet movement (Thaut and Hoemberg, 2014).

- **Therapeutic instrumental music performance:** is the playing of a musical instrument in order to practice or stimulate a functional movement model. Appropriate instruments are selected to induce range of motion, endurance, strength, functional hand movements, limb coordination (Thaut, 2015).

- **Linguistic and speech rehabilitation (melodic intonation therapy):** is a technique developed for the rehabilitation of expressive aphasia, where the preserved ability of the patient to sing is used for spontaneous stimulation of volitional speech through singing melodies reminiscent of natural speech (Thaut, 2015).

- **Musical sensory orientation training:** application of recorded or live music to improve the child's awareness, to stimulate his reactivity to external stimuli, orientation in time and space. In the more advanced stage of treatment, the children themselves engage in simple performances of musical instruments (Ogata, 1995).

- **Auditory perceptual training:** application of music exercises for discrimination and identification of various components of sound, such as duration, tempo, rhythm, pattern, etc. It also integrates different sensory modalities such as visual, tactile, kinesthetic (Hoare et al., 2010).

- **Attention control music training:** includes structured active or receptive music activities in which the musical elements elicit different



musical responses in order to practice selective, sustained, divided attention (Bell, 2017).

- **Musical mnemonic training:** application of musical exercises to stimulate various memory encoding or decoding functions. Musical stimuli can also be memory exercises such as song, rhyme, stanza or stimulate the learning of non-musical information (Gardiner et al., 2014).

### **Behavioral music therapy**

As with behavioral therapy, the focus of the treatment is on behavioral modification (behavior conditioning), which can be measured by applied behavioral analysis. Whether working with a child with an autistic spectrum disorder or an adult with depression, the process is based on the stimulus-response concept, with music being a stimulus and expected to give a positive response. The term behavior is a broad term and includes several components: physiological behavior, motor behavior, psychological and emotional behavior, cognitive, perceptual and autonomous behavior. Regardless of the population we work with (children, adults, the elderly, various developmental disabilities, etc.) in the treatment various musical activities such as dancing, singing and movement are structured and implemented, in order to achieve non-musical goals: social inclusion, communication, physical activity, attention and concentration, cognitive processes, increasing independence, etc. (Edgerton, 1994).

### **Conclusion**

It can be stated that music therapy as a form of treatment helps a lot in the emotional, physical and spiritual condition of an individual. There is enough scientific evidence to support the therapeutic effect of music. From the very beginning, when music therapy has been used only in some psychiatric and veteran hospitals, as a form of adjuvant therapy, this type of treatment has increasingly encountered as an integral part of treatment in various institutions.

The greatest success of music as a medicine is reflected in the fact that sound and vibration have a great impact on all regions of the brain, which is why many musicians and music professors say that it is first a mental and then only a physical activity. Therefore, its influence on various diseases of intellectual or physical nature is multiple. Music therapy should not be limited only to the treatment of people who have health problems, but it can also be used by completely healthy people, to make it easier to perform some daily tasks, because music has always been and will be a part of everyday activities.

Music and children are connected in different ways. Mental health is an integral part of a child's general health and is an important source of

strength and security for the individual and the family. Music therapy can help a lot and encourage a person in certain areas. For many centuries, the influence of music on the life, physical and spiritual condition of children has been studied in various civilizations. A number of studies have shown the importance of music for the general condition of children.

Music therapy has been shown to help with a number of medical conditions, such as autism, depression, trauma, and schizophrenia. For this reason, in the second half of the 20th century, a number of methods of music therapy were developed, which is an indispensable form of treatment in most hospitals. It is believed that music as a therapy can improve communication, support change and enable people to live more refined and creatively. It encourages relaxation, and resilience - the search for inner strength, communication and expression, reduction of antisocial behavior, reduction of pain, prenatal relaxation. The choice of music depends on a number of variables and they are different for each child and have a different impact on each of them. This chapter provides an overview of the possibilities of using music therapy for the purpose of improving the general condition of the children with special educational needs, and as an incentive for greater interest in using music in scientific research for better use of music in everyday life as well as for medical purposes and in practical application.

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