



The Mechanism of Action of Music Therapy. Considering Social, Cognitive and Emotional Development within a Pedagogical Framework.

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Abstract:

Music therapy is a collective term for music as a tool in the process of development, correction and rehabilitation. Its theoretical background, framework and methodology are always adapted to the activity in which it is applied. The therapy uses music as a catalyst for emotional mobilization. This allows the processing of feelings and memories in the form of symbols. Among its effects can be highlighted the following: stress relief, relaxation, mobilization of experiences, conflict management, and enhancement of experiences and activity. At the same time, there are also experimental examples of its effects on relaxation, taste formation and skill development. In pedagogy, it is now natural to use music as a tool to achieve the musical transmission effect. In therapy, music acts as a catalyst in triggering emotions and emphasizing verbal information, and the goal is for the participant to become a creative participant in his/her own life by creating musical improvisations. This does not require musical expertise. In music pedagogy, on the other hand, the main goal is to create aesthetic values (Konta, 2005, 2010; Szabadi, 2021). According to Lindenbergné (2005), both therapy and pedagogy serve personality development. In the course of leisure activities and workshops, the teacher can apply the methods and tools of music therapy within a pedagogical framework. At the same time, music education can also develop skills targeted by therapy, such as adaptation, empathy, attention, and so forth (Urbánné, 2005). And within this pedagogical framework, the social, emotional and cognitive transfer effect of music is realized in a measurable way.

Keywords:

music therapy, musical experiment, musical transfer effect, music therapy experiments

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Introduction

Various educational, psychological and neurological studies have shown that music therapy can play an important role in personality development, correction and rehabilitation. An important element is the safety,² which is the basis for the participant to experience, evaluate and practice the events in the outside world (for example, resolving conflicts in social situations) in a protected space. And to receive objective, uncritical feedback on them, based on the trusting relationship between the group members and the therapist and the group/individual. Feedback helps the participant to correct his/her experiences, thinking and behaviour as necessary. The extent, form and manner of this, and its effectiveness, may depend, among other things, on the traumatic depth of the experiences. Namely from their personal meaning, individual abilities and motivation, current psychological state and life situation. It is the therapist's competence to organise these into a system, to create the atmosphere and conditions for their unfolding, taking into account the principles of continuity and gradualness. A key element of the above is the precise and appropriate choice of musical style,³ musical elements and methods.

The levels of therapy are arranged in a hierarchy (Figure 1).

Figure 1

Hierarchical Connection of Elements of Therapy – Illustration



Therapy is a tool for prevention and development at the level of primary prevention, which also includes the framework of pedagogy. Since education is part of the support services. Because both the therapist and the teacher shape the personality holistically. At the secondary level of therapy – in the clinical area – the focus is on healing and reducing symptoms, which is beyond the competence of the educator. While at the tertiary level of therapy,

² Security, safety: in its current sense, emotional and psychological safety, which is built on acceptance and trust; while physical comfort provides the foundation for this.

³ Musical style: in its present sense, it refers to the genre, the expressive nature of the music. For example, calm, rhythmic, improvisational, etc. Or even to an era in music history, for example, baroque, classical. Both can influence responses and reactions in therapy.

the task is to support recovery in rehabilitation. At this level, the teacher can collaborate with a developmental/special education teacher, conductor, psychologist, etc. at the level of practices. However, at all three levels, music therapy can only be considered as a complementary tool. Musical instruments must be integrated into the methodology of the basic activity in which they are to be used. In the field of education, an example is the non-professional use of musical instruments for relaxation, motivation, creating experiences, managing anger etc. Overall, to solve methodological and behavioral problems.

It is now common practice to use music as a tool in the above ways in educational practice. While in therapy, music is used as a catalyst to evoke emotions and emphasize verbal information. Therapy is aimed at a process in which the patient becomes a creative participant in his/her own life by creating a musical intervention. In music pedagogy, on the other hand, the main aim is to create along the lines of aesthetic values (Konta, 2005, 2010; Szabadi, 2021). According to Lindenbergerné (2005), both therapy and pedagogy are at the service of personal development. During leisure activities and workshops, the teacher can use the methods and tools of music therapy in a pedagogical framework. At the same time, music education can also develop skills that are targeted by therapy, such as adaptation, empathy, attention, etc. (Urbánné, 2005). Furthermore, from a performing arts and pedagogical perspective, active music making and collaboration develop fine motor control, attention, and visual-spatial awareness, offering deep engagement for both the therapist and the participant. These multisensory and social elements play a central role in how music supports development and rehabilitation. A comparison of therapy and pedagogy is presented in Table 1.

Table 1

Comparison of Therapy and Pedagogy
(Source: Szabadi, 2014, p. 177.)

Aspects	Therapy	Pedagogy
Duration	shorter in time	for an indefinite period
Participation	volunteer	mandatory
Performance	does not criticise	assesses performance
Form	focuses on individual, group	mostly group
Goal	development, service	information acquisition, accountability

In the hierarchy outlined, therapy is separated from the meaning of cure and can be placed in the process of resolving the problem that is interfering daily life. The key of therapy is the engagement and motivation of the participant, on which the process itself can be built. Musical elements precede, accompany and calm the emotions that arise during the exercises of the session.

Problem Statement

There are many studies on the transfer effect of music and the mechanism of action of music therapy (e.g. Ye, Huang, Zhou, & Tang, 2021; Hou, 2022), but we see few examples of what alternative methods and application options are available within a pedagogical framework to address socio-emotional, cognitive, and professional problems. Questions and gaps arise regarding the theoretical definition of music therapy, pedagogical models, and the competence and background knowledge of the teacher in the field of music therapy. Furthermore, the comparison between therapy and pedagogy is unclear, especially from an educational perspective. Thus, the teacher faces numerous social and cognitive problems when the means of solution are lacking.

Literature Review

Music Therapy: Definitions, Theoretical Models

When you look at the definition of music therapy, it turns out that it is an umbrella term. Its methods and tools draw from a wide range of disciplines. It uses musical elements as a tool for the development, correction⁴ and rehabilitation of psychological functions and for the support of the personality (Szabadi, 2021).

According to Buzasi (2003), music therapy is a therapeutic intervention in a musical environment. The goal of therapy is achieved through interpersonal communication, conscious control of relational factors and the use of psychological tools. Buzasi (2006) further defined it as the harmony of body-mind-spirit balance, achieved through the conscious use of sound through the application of psychological, therapeutic procedures. According to the American Music Therapy Association's 2005 definition, "music therapy is the clinical and experiential use of musical instruments in a therapeutic setting to achieve individualized goals" (cited in Kollár, 2007, p. 828). Kónta & Zsolnai (2002) also interpret music therapy as a method that focuses on the personality development effect of music. Bruscia's (1987) theory also focuses on the maintenance, development and restoration of physical and psychological harmony and well-being, to which music therapy contributes through the experience of music. Robb's (2013) approach concretizes that music therapy uses music interventions based on clinical and empirical evidence to achieve individual goals, the terrain of which is the safe space between the therapist and the patient.

Thus, in music therapy, the emphasis is on therapy, the scope and conditions of which are not the same as music education and recreation, *but do not exclude them* (Buzasi, 2006; Szabadi, 2021). All this is based on the therapist's original profession in the humanities (e.g., doctor, teacher, pastor,

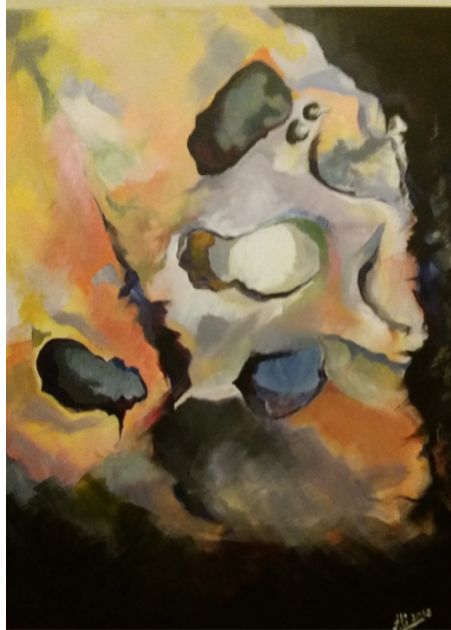
⁴ Correction: in the present sense, an intervention, a kind of adjustment.

social worker, etc.). In practice, a teacher can use creative musical exercises in the methodological solutions, which have an impact on tension relief, experience mobilization, attention, cooperation, and other related skills. Such exercises can include, for example, rhythm and movement exercises.

As music therapy is situated within the group of art therapies (music, visual and movement), we highlight Payne's (1993) and Case and Delley's (2006) theories of art therapy. They all focus on art as a means of expressing experience (Figure 2).

Figure 2

Art as a Means of Expressing Experiences
(Source: Attila Kráfcsik: Cave drawings)



According to Payne (1993), its focus is on the communicative elements, on the wide range of self-expression in the safe atmosphere of therapy, where the deepest feelings can be expressed. Case & Delley (2006), on the other hand, express and focus on therapeutic creation from the perspective of practice, which is a symbolic reflection of the patient's experiences and life events, and is distinct from artistic creation in the aesthetic sense. Through the product created during the therapy, the therapist and the patient try to jointly interpret the experiences of the patient. Pedagogical practice provides a good opportunity for various spatial integrations. For example, while listening to music, expressing and processing the musical experience in symbolic form (in drawing, through dramatic play or during conversation).

So, in a pedagogical context, in addition to bringing feelings and memories to the surface, music therapy deals with „listening”, rhythmic improvisation, other musical elements (tone, singing) as well as movement, cooperation, spontaneity, visualization and coordination. It analyzes and creatively processes experiences. These activities activate both mental and physical processes.

For the meaning of the therapy, Buzasi (2003, p. 18) cites the Duden Etymologie. „...the actual meaning of the word therapie, borrowed from the Greek word therapeia, is: to care for, to serve.” The root word is therapon: to serve, to accompany, is now used only in a psychotherapeutic context. Missura’s (2005) theory also supports the idea that the meaning of therapy is related to the functions of service and protection. This suggests that music therapy is not only about healing, but also about accompaniment, service and support. In other words, it does not only and strictly refer to recovery from illness,⁵ but also to the alleviation of difficulties that pervade daily life and hinder personal life (Szabadi, 2021). Related to this from a pedagogical point of view is the fact that the word ‘paidagogos’ is also Greek for servant accompanying the child (Telek, 2017).

In view of the above, it should be emphasized that music therapy alone cannot replace original supportive, curative procedures, such as pharmaceutical treatment, but as Vértés (2010, p. 90) cites Wilms’ theory „...it can be used as a second line of treatment for certain psychological disorders and subjective complaints.” In other words, it is an additional element of a complex activity or procedure (Szabadi, 2021). In practice appropriate therapeutic methods and tools can be used in the event of technical or skill deficiencies during music learning.

Stacho (2005) divides the music therapy models into two directions: the clinical and the psychological music practices. The latter is characterized by two directions. 1. The emotion-driven one, which sees the emergence of the musical experience as a pre-recruitment of cognitive processes and as innate in us. 2. The post cognitive, on the other hand, sees the creation of the musical experience as a consequence of cognitive processes. The approach of the music therapy trends can be linked to certain schools of psychotherapy. The psychoanalytic school focuses on the relationship between music and the unconscious. It focuses on the analysis of unconscious experiences catalysed by music. The behavioral psychology trend focuses on musical activity and instrumental playing, while the social psychology trend focuses on practicing communicative elements (Konta & Zsolnai, 2002). The latter two can also appear in pedagogical practice. The updating and combination of methods, trends and tools is based on the creativity of the therapist and comes from the relational dynamics of therapy (Szabadi, 2021).

⁵ Illness: deterioration of health, difficulty.

Transfer Effects of Music (Therapy)

Buzasi (2003, 2006) distinguishes between the physiological and psychological mechanisms of music. Physiological mechanisms of action include vegetative function, heart and blood pressure regulation, the creation of a general relaxed state or stimulating activity, and pain relief. Psychological mechanisms of action include emotional expression, attention-concentrating, communication, experience-constructing, and association effects. Since music mobilizes unconscious memories in the therapeutic process, it explores and interprets unconscious processes, and dissolves psychic resistance. This is explained by the transformative potential of music. This means that the experiences and feelings expressed by the basic elements of music (rhythm, melody, harmony) are corrected by replaying them and playing them on a musical instrument. In short, our feelings undergo an experiential reworking through the transformative potential of music (Figure 3) (Bagdy, 2005). This reduces our negative and stressful experiences. The transformational potential of music mentioned above can be one manifestation of the musical transfer effect within pedagogy.

Figure 3

The Transformational Potential of Music – Illustration



Fields of application, methods and tools

At the level of primary prevention, music therapy is a tool for development. It aims to reduce the risk factors that trigger the disease. In a word, it is at this level that health promotion and health protection are at task. At the secondary level, in the early diagnosis of disease, it can be an adjunct to treatment. At the tertiary level, it can be used as a tool for the rehabilitation of

damage and complications resulting from illness or injury. The pedagogical part of music therapy can be linked to the first and third levels.

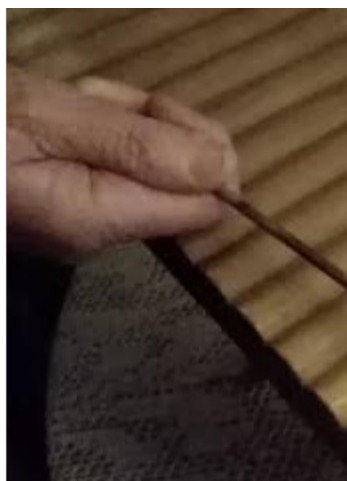
The application areas of music therapy are clinical, social and other educational areas. In the latter, it can play a role as a skill development tool or as a way to restore physical and mental balance (Buzasi, 2006). Of course, the application areas and goals can be intertwined and updated, the current presentation is just an example.

There are two forms of music therapy. According to Buzasi (2006), in the active form, we represent different life situations, experiences and feelings through instrumental improvisation and dramatic techniques. In a pedagogical context, we can think of the experience-mobilizing and socializing effects of circle games and creative rhythm exercises. This form is multimodal, capable of inducing motor, auditory and behavioural responses that can be perceived by all our senses. This allows the musical transfer effect to unfold in a pedagogical environment. The receptive form focuses on listening to music. It concentrates on sharing, awareness, interpretation and processing of the musical experience. In receptive therapy, music is manifested in subjectively perceived psychomotor activity. Which stimulates the ability to associate and the imagination. In pedagogy, the content of children's songs, nursery rhymes, and circle games provides an opportunity for this.

Music therapy improvisation (Figure 4) is a spontaneous improvisational game that creates acoustic sound/tone (Buzas, 2006).

Figure 4

Music Therapy Improvisation – Illustration



Professional musical improvisation is a communication process based on a specific musical theme. Its performance requires expertise and is structured, shaped and performed in a musical way. Music therapy improvisation,

on the other hand, is a communication game with momentary emotions, feelings and memories. Its structure, form and performance are not predetermined, no musical expertise is required, no expectations. It is a sudden impulsive start, where therapist and patient seek a common focus (e.g., in tempo, volume) (Bruscia, 1987; Fabényi, 2017; Tiszai, 2017). Therefore, the task of music therapy improvisation is to create order out of chaos. In other words, the volume, tempo and rhythm should be even, and the players should develop a sense of attunement by listening to each other. But, it is not the same as a musical performance, what music education and performing arts expect (Urbánné, 2017).

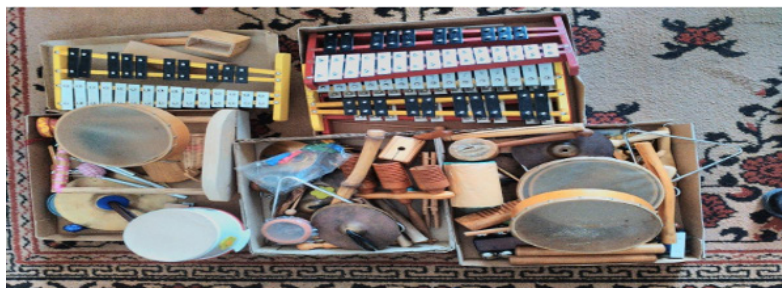
The methods of music therapy are conflict and behaviour centred. The former is based on awareness and processing of experiences that emerge through the catalytic effect of music. In the latter, it seeks to shape behaviour through dramatic techniques and instrumental play (Buzasi, 2006). The methods of music therapy are conflict- and behavior-focused. The former is based on the awareness and processing of experiences arising through the catalytic effect of music. The latter strives to shape behavior with the help of dramatic techniques and instrumental playing (Buzasi, 2006). In pedagogical terms, we highlight the development of cooperation, adaptation, empathy, attention, etc., that occurs in choir singing and instrumental rhythm practice.

The directions of music therapy are analytical, behavioral psychology and social psychology. In a pedagogical framework, they can manifest themselves, for example, in the expression of musical experience through drawing, movement and free instrumental improvisation (Konta & Zsolnai, 2002; Szabadi, 2021).

The tools of music therapy are musical instruments (from classical to self-made instruments) (see Figure 5), body sounds (e.g., clicking, clapping, etc.) and animated sounds (e.g., sighing, growling, shouting, etc.). Their use, combination and implementation depend on the competence and creativity of the therapist. And above all, they must be adapted to the goal of the therapy (Szabadi, 2021). The three levels of goals are: (1) the general level, which is about developing self-awareness, for example, (2) at the social level, improvisation aims to create a communal experience, (3) at the individual level, improvisation focuses on processing the person's specific problem. According to the basic elements of music, rhythm energizes, shapes behavior, and appears in the active form of music therapy. Melody and harmony mobilize memories, which in turn are used in a receptive form (Bruscia, 1987). The line between the elements and goals identified above is thin. And this limit is adjusted to the competence of the therapist and the actual problem. In a pedagogical context, songs that create a mood, motivate, and reduce tension, or children's games supplemented with movement and dialogue, are suitable for this.

Figure 5

The Music Therapy Instrument Set, Example
(Source: Szabadi, 2021. p. 63)

**Overview of Research Results*****Methods and Applications***

Emotional expression is crucial in the course of therapy, as it is fundamental to the formation, development and regulation of a relationship (Ekman, 1999). In therapy, musical improvisations contain certain emotional signals, and the meaning of these needs to be understood in order to the efficiency (Gilboa, Bodner & Admir, 2006; Phan Quock, 2007). In pedagogical practice, the expression, recognition and regulation of emotions ensure the success of communication and interaction. In this, musical elements authenticate and enrich verbal and non-verbal signals. Such can be, for example, the lyrical excerpts of songs, the manner and form of playing musical instruments. We can evaluate, on the one hand, the musical elements (tone, volume, tempo), and on the other hand, the emotional content of the improvisation with different measurement scales or by listening back to audio recordings.

Clement-Cortes (2004) also examined emotional skills. In his opinion a more relaxed, comfortable state of mind is achieved through the effective and accurate emotion expression, which indirectly contributes to the positive changes in the communication, self-expression and the surfacing of memories in the therapeutic process. In his studies, Vértés (1995) concluded that, in addition to the relaxation effect, instrumental playing involves powerful visual, auditory, concentration and cognitive processes, and can therefore contribute to maintaining mental and physical fitness. In addition, he observed taste-forming effects of music therapy sessions (Vértés, 2010). The pedagogical implication of these physiological impact studies is that the physiological effects of music help create mood, motivation, and a physical state that prepares and reinforces the content of the activity or lesson.

Music therapy is also beneficial in behavioural deficits and motor disorders, as observed by Altmüller et al. (2009). Dramatic, creative musical

practice reduces aggressive displays, while increasing positive interactions. There are more cooperative displays and more effective communication as measured by observations and socialization scales (Chao-Fernández, Gisbert-Caudeli & Vázquez-Sánchez, 2020). Musical practice can also induce physiological changes in the body. Hauck et al. (2013) demonstrated that active music therapy and listening to favorite music resulted in improved activity and a pleasant physiological well-being. This was confirmed by physiological measurements.

Münste, Altenmüller and Jancke (2002) found in their study that regular music practice improves the efficiency of information processing and also affects other areas, such as language, attention and memory functions. All this was demonstrated with cognitive tests. Koelsch et al. (2000) and Koelsch (2009) investigated musicality, showing that the brain triggers responses to out-of-tune chords. Tonality was also at the center of the experiment of Suda et al. (2008). They confirmed the stress-reducing effect of the major key compared to the minor. For this, electrophysiological studies were used. Cognitive neuroscience therefore confirms the positive effect of musical transfer on the aforementioned skills, such as language, memory, and tonality perception.

However, a number of impact evaluations (e.g., Maratos et al., 2009; Bradt & Dileo, 2010; Mössler et al., 2011) highlight questions that arise when evaluating the mechanism of music therapy. These are the following. The developmental, positive effect of music therapy may result from the one-sided bias of the therapist and the observer. A multidimensional, higher level of evaluation is needed in the assessment of impact, because it is not possible to isolate which factors are involved in the impact factors and in what proportion. Related to this, the surrounding activities need to isolate. Furthermore, the relationship between sufficient duration of therapy and effectiveness is also difficult to concretise.

Therefore, the effects of music therapy cannot be examined in isolation, as it is not an independent procedure. Its theoretical background, tools and methodology are always adapted to the activity in which music therapy is applied. Therefore, it can only be experimentally measured and validated with the same measurement tools and methodology as those used in the main activity (Szabadi, 2021).

Research Examples Investigating the Mechanism of Action

Fernández, Vázquez & Ferreiro (2014) complemented the effectiveness of music education in schools with different digital music games (e.g., instrument grouping, melody and rhythm analysis), which had a transfer effect with positive changes in emotional skills, academic performance and reduced symptoms of behavioural disorders. A pilot study by Rickson & Watkins (2003) found that music therapy sessions in schools that promote au-

tonomy and creativity help to develop prosocial behaviour in adolescents with aggressive, social and emotional disorders. Ye, Huang, Zhou and Tang, (2021) also found a reduction in aggression in adolescents, coupled with an increase in self-control, as a result of music therapy sessions in a meta-analysis. And Hou (2022) concludes that music therapy can be part of school mental health, helping to articulate negative emotions, reduce psychological problems and develop a healthy personality.

The positive effects of music therapy have been observed on sleep quality, and in this context, cognitive abilities (memory, attention, etc.), an increase in the number of positive interactions, a decrease in social isolation, emotional expression, mood, and attentional focus. The above were examined with social and cognitive tests, measurement scales, electrophysiological markers, and measurement methods (Kollár, 2006, 2007; Harmat, 2009; Bütner et al., 2009; Chuang, Han, Li & Young, 2010; Hauck et al., 2013).

When examining instrumental music, Clements-Cortés (2004) and Vértes (1995, 2010) concluded that instrumental music is a complex auditory, motor and visual training that can maintain physical and mental well-being. It indirectly affects emotional, social and cognitive processes and skills (e.g. emotional expression, social isolation, etc.).

Comparative studies focusing on research methodology have drawn attention to the bias of evaluation when assessing the effects of music therapy. The biasing factors can be: imprecise determination of the duration and frequency of the study, lack of multi-criteria evaluation of control groups, lack of consideration of sample size, lack of comparison with other procedures (Herkenrath, 2005; Sutter & Wormit, 2007; Maratos et al., 2008; Bradt & Dileo, 2010; Scrine, 2021; Mössler et al., 2011).

Summary

Music therapy is an umbrella term that uses music as a tool in the process of development, correction and rehabilitation. Its theoretical background, framework and methodology are always adapted to the activity in which it is applied. Therapy uses music as a catalyst for experiential mobilisation. This makes it possible to process feelings and memories in the form of symbols.

There are two forms of music therapy, active and receptive. The first is based on instrumental improvisation, which does not require any expertise. The second is based on the awareness and processing of experiences that arise during listening to music. Music not only provides the tools for the therapeutic session, but also the framework and validation of what is being said. It is through the experience of playfulness and joy that musical instruments can be introduced into therapy. Among her methods, behaviour-centralised method, which helps to shape behaviour through instrumental improvisation and dramatic exercises. And it is important to make the experiences in therapy relevant to the present. The conflict-centred method, on the other

hand, seeks to uncover and analyse unconscious experiences. Because music is temporal and characterised by a kind of point-ness, it is identical with itself „then and there”, it can faithfully represent the dynamics of spiritual life.

Among its effects we can highlight the following. Relieving tension, relaxation, mobilising experiences, resolving conflicts, enhancing experience and activity. But there are also experimental examples of relaxation, taste-forming and skill-development effects. There is also evidence of transfer effects on memory and other cognitive processes, the formulation of life emotions, nervous system activity, socialisation and behaviour in clinical, social and other educational settings. In pedagogical terms, therapy is a kind of attitude, a supplementary method and a system of tools beyond professional methodological solutions. In this framework, the transfer effect of music therapy is effective. Practical examples are alternative, creative rhythm exercises, practicing musical elements with movement and dramatic play. In this case, the aesthetic principles of the „musical product” are not effective, but emotional mobilization and processing of experience. Because while pedagogy is oriented towards a creation, therapy is oriented towards a process. Working on a musical instrument is a developmental tool in therapy, and in pedagogy it is a means of acquiring knowledge. While the goal in music lessons is to acquire and develop musical knowledge and skills, until than in music therapy instrumental improvisation is a means of self-expression and communication. The therapist acts as a kind of catalyst and, through music, „puts” the participant in a situation, stimulating them to activity and cooperation. But pedagogical work with a therapeutic attitude can also have this effect. The difference lies in the goal, framework, and system of conditions, as well as in the background knowledge and competence of the therapist.

Furthermore, we must emphasize that from a research methodological perspective, the bias inherent in the use of different evaluators must be taken into account when evaluating the impact of music therapy. When setting up the experimental and control groups, the broad spectrum and the effect factors of the surrounding occupations need to be taken into account and evaluated as background factors. The choice of the duration of therapy is also a key factor for effectiveness. It is important to adapt it to the activity in which the music therapy is applied. And the musical exercises and interventions should also be adapted to the goal of the therapy, based on the needs of the participant.

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