

MUSIC THERAPY AS AN ALTERNATIVE APPROACH TO STRESS CORRECTION

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Abstract

Stress is increasingly seen as an integral part of everyone's daily life. Therefore, the search for effective non-drug ways to reduce stress is a pressing issue nowadays. Music therapy is used as a non-drug method of anxiety control due to its depressant effect on the sympathetic nervous system, which leads to a decrease in both adrenergic and neuromuscular activity, thus reducing anxiety of patients. Music therapy can affect the autonomic nervous system and reduce stress and stress-related health problems, restore the balance of the immune system, especially when music is known and liked. Musical intervention can cause pleasure and the associated secretion of the neurotransmitter dopamine, also cause a relaxing state and can reduce cortisol levels and, accordingly, stressful states. Listening to music can be considered a means of reducing stress in everyday life, especially if it is listened to in order to relax. Thus, the analysis of the literature indicates the feasibility of using music therapy as a non-drug approach for stress correction.

Keywords: *music therapy, stress, non-drug ways.*

Stress is increasingly seen as an integral part of everyone's daily life [27, 32]. The COVID-19 pandemic has led to massive restrictions at the public and private lives of people around the world: it provoked a general atmosphere of vigilance and uncertainty, concern for their health and the health of loved ones, lack of specific drugs, lack of artificial ventilator of lungs and lack of beds in intensive care units needed to care for the growing number of seriously ill, etc. [28, 29, 30]. Also, in the period of the COVID-19 pandemic, the fear of being an asymptomatic patient (possibility of spreading without knowledge) continues to cause further public concern [31].

Stress itself is a factor that can affect the homeostasis of the body and activate (incorrectly) adaptive behavioral, physiological and cellular responses [34]. Although there are several approaches to treating anxiety, Peter Roy-Byrne's 2015 study found that only 50% to 60% of people respond to medication and psychotherapy, and only a quarter of patients completely lose their symptoms [26]. In addition, drugs used for pharmacocorrection of stress are characterized by significant side effects, such as hemodynamic disorders, respiratory depression, intestinal obstruction, cognitive dysfunction, post-traumatic stress disorder, etc. [34, 35, 36, 37]. Therefore, the search for effective non-drug ways to reduce stress is a pressing issue nowadays.

Music therapy is used as a non-drug method of anxiety control due to its depressant effect on the sympathetic nervous system, which leads to a decrease in both adrenergic and neuromuscular activity, thus reducing anxiety of patients [20, 21, 22]. The beneficial effect of listening to music at health is mediated by the reduction of psychophysiological stress [19]. Music therapy can affect the autonomic nervous system and reduce stress and stress-related health problems, restore the balance of the immune system, especially when music is known and liked. Music therapy is used to excite in a clinical setting because it can benefit patients by distracting their attention from unpleasant experiences and future interventions.

Music and music therapy approaches are widely used in clinical and preclinical settings to improve psychologist symptoms, cognitive function, behavior or generally speaking, improve people's

well-being. These responses are associated with increased excitement [47], which leads to a temporary increase in productivity in many cognitive areas including spatial reasoning [44], attention [24, 28], information processing [110] and memory recognition [111] of healthy individuals.

Back in 1993, it was covered in the works of Rauscher et al. [10], that listening to Mozart's music helps to improve the processes of reasoning and the ability to think abstractly. Auditory stimulation evokes emotions associated with increased productivity of cognitive processes. Today, there is strong evidence that favorite music helps modify stress and strengthen the immune system.

Musical intervention can cause pleasure and the associated secretion of the neurotransmitter dopamine [10], also cause a relaxing state and can reduce cortisol levels and, accordingly, stressful states [17, 18]. Elevated dopamine levels in healthy individuals are known to improve cognitive and attention performance [13, 14].

There are conflicting data on the effect of listening to music on the level of the stress hormone cortisol [8]. Another study found that relaxing music was less effective at lowering cortisol levels than, for example, the sound of gurgling water. [9].

According to a double-blind randomized trial (sample of 143 participants) in which acute stress was simulated with the help of (CO₂) and its effects and recovery from stress were assessed by exposure to mediators of immune function (IL-6, TNF- α , leptin and somatostatin), as well as noradrenaline and two hormones of the hypothalamic-pituitary-adrenal axis (ACTH and cortisol) [1] for the musical group as stimuli were used 18 works of instrumental music (without lyrics) from different styles and eras (classical, jazz, irish folk music, south american music, reggae). The range of beats per minute was 106-132. It has been shown that these works evoke feelings of satisfaction and happiness. Moreover, during the recovery period of 1 hour, we repeatedly measured these serum parameters and introduced a protocol of induction of auditory mood with positive music and a neutral control stimulus. Acute stress caused an increase in norepinephrine, ACTH, cortisol, IL-6 and leptin. Norepinephrine and ACTH showed the fastest and strongest responses to stress, followed by cortisol, IL-6 and leptin. Musical intervention was

associated with a more positive mood and stronger cortisol response to acute stress in the music group. Our data show that acute (CO₂) stress affects endocrine, immune, and metabolic functions in humans, and they show that mood plays a causal role in modulating responses to acute stress.

Auditory stimulation evokes emotions associated with increased excitement and leads to a temporary increase in productivity in many cognitive areas in the structure of the brain: the hippocampus and tonsils are involved in the regulation of the emotional sphere. Positron emission tomography and functional magnetic resonance imaging have shown that listening to pleasant music activates the cortical and subcortical areas of the brain, where emotions are processed. The overall positive effect of listening to pleasant music can be a stimulant that improves cognitive ability.

Another study found that simply listening to music was effective in reducing subjective stress ($p = 0,010$) [3]. The most profound effects were found when the reason for listening to music was «relaxation» with a subsequent decrease in subjective stress ($p \leq 0,001$) and a decrease in cortisol ($p \leq 0,001$).

Listening to music can be considered a means of reducing stress in everyday life, especially if it is listened to in order to relax [3]. Listening to famous and favorite music helps reduce the burden of disease and strengthens the immune system by modifying stress. One study found that 2-week interventions with listening to music can reduce stress, anxiety and improve sleep quality of pregnant women with sleep disorders [2].

Music therapy can also reduce maternal stress and improve parental and child health, and live music therapy has been studied as a strategy to optimize the hospitalized environment. Music interventions and music therapy have been shown to have a positive effect at high risk and short-term outcomes for infants [23, 24], with new evidence pointing to potential long-term benefits, including neurodevelopment [25].

Another study found that usage of music as a therapy for women with breast cancer reduces stress and anxiety [15, 16]. It is well known that cancer patients who respond to the disease are only physical symptoms, but due to loss of work or

vacation social isolation, fear, despair, anxiety, depression that lead to emotional suffering.

Another study found that listening to your favorite music has a positive effect on the function of the heart and nervous system [11, 12]. Music of high valence and low level had a positive effect at the restoration of heart rate and skin conductance after stress. Auditory stimulation by music evokes emotions that are often accompanied by physiological reactions, such as changes in heart rate, respiration, skin properties and hormone secretion.

Recently, neurological music therapy has become especially popular, which is becoming a new direction in music therapy. Neurological music therapy is an alternative way to access functions that are not available due to non-musical stimuli arising from diseases of the human nervous system [33].

Two meta-analyses reported a positive effect of music therapy at the reduction of anxiety of hospitalized patients [38, 39].

Thus, the analysis of the literature indicates the feasibility of using music therapy as a non-drug approach for stress correction.

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