Music Programs Designed to Remedy Burnout Symptoms Show Significant Effects after Five Weeks

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Earlier studies have demonstrated that music interventions can lessen symptoms of depression. Depression and burnout are closely related. We hypothesized that specially designed receptive music therapy programs and protocols might reduce the symptoms of burnout. In a four-arm randomized, placebo- and waiting-list-controlled double-blind study, including 150 participants, two specific music programs significantly reduced burnout symptoms after 5 weeks. The effects were maintained over a long time period. This newly developed method of receptive music therapy was also evaluated for the treatment of depression and dysthymia, with significant outcomes.

Key words: **music medicine; music therapy; burnout; depression; dysthymia psychophysiology**

Introduction

The application of music in medicine is an emerging discipline, as shown by the growing body of scientific evidence of its usefulness in alleviating a variety of conditions. Other than active music therapy, which applies varying music stimuli that are played live by the music therapist or the patient himself in one or more therapy sessions, receptive music therapy and music medicine apply programs of prerecorded music stimuli as clinical interventions. In receptive music therapy the concept of utilizing music with the intention to treat should be based on the knowledge of which specific musical stimuli can trigger specific effects that can be applied to either ameliorate the symptoms of certain disorders or, potentially, positively influence the cause of the disease directly.

The Research Program MusicMedicine (RPMM) at Paracelsus Medical University has focused on the question of which elements of music influence which parts of the organism (and which aspect of the psyche) in which way. In our basic research, we were able to demonstrate the potential influence of distinct music parameters on psychophysiological variables measuring skin conductance, skin potential, and muscle activity (electromyography) and analyzing them with newly developed algorithms and neural networks.

As a result of our research, we began to test different hypotheses about how music has to be composed and how it has to be applied to increase the self-regulatory capacities of the

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The Neurosciences and Music III: Disorders and Plasticity: Ann. N.Y. Acad. Sci. 1169: 422–425 (2009).
doi: 10.1111/j.1749-6632.2009.04790.x

organism and thus improve the state of health of the patient. We were thus able to create a set of standardized music stimuli that influence the regulatory capacities of the nervous system significantly.[1]

Depression and burnout are closely related, for people affected by the burnout syndrome usually experience depressive symptoms.[2] On the basis of our observations, and the results of our earlier studies, we assumed that music interventions may have the potential to mitigate depressive states (which was later also suggested in a Cochrane Report[3]), and we hypothesized that treatment protocols based on specially designed music programs might significantly reduce burnout symptoms.

The mechanisms by which music can influence impaired functions of the brain related to depression are not known. During the last decade, the use of functional neuroimaging techniques, such as fMRI and PET, has shown that listening to music can modulate activity in central brain structures of emotional processing. These structures include the amygdala, the hippocampus, the anterior cingulate cortex, the orbitofrontal cortex, the temporal poles, the parahippocampal gyrus, the ventral striatum/nucleus accumbens, and the insular cortex.[4–8] A proposed neurohumoral pathway by which music might exert its sedative action is based on a model that includes an interaction of the hypothalamic-pituitary axis with the adrenal medulla via mediators of the unspecific immune system.[9] In a recent experiment initiated by Eric Kandel (recipient of the 2000 Nobel Prize in Medicine or Physiology for his research on the physiological basis of memory storage in neurons), mice were trained to resist stress by listening to sounds. The data suggests that safety learned with the help of auditory stimulation is a model of a behavioral antidepressant that shares neuronal hallmarks of pharmacologic antidepressants.[10]

Burnout is increasingly common and grows, in many cases, into an existential threat to those who are affected by it. Further, burnout may also lead to seriously disruptive consequences for society, organizations, and companies. Burnout syndrome is a set of physical and psychological symptoms, including fatigue, anxiety, depression, irritability, cognitive weariness, sleep disturbances, headaches, gastric spasms, nonspecific pain, and poor health behavior. Burnout develops gradually; symptoms can appear over several years. Prior studies link burnout with ill health, including metabolic syndrome, dysregulation of the hypothalamic-pituitary-adrenal axis and sympathetic nervous system activation, systemic inflammation, and impaired immunity, blood coagulation, and fibrinolysis.[11]

From a mental health perspective, burnout is characterized by low personal accomplishment, high levels of mental exhaustion and depersonalization, depleted emotional resources, and the loss of stress resilience. Progressive burnout results in decreased productivity. Without effective measures and adequate treatment, affected patients risk mental breakdown, after which complete recovery is difficult and relapse is common. There is, therefore, an urgent need to develop and evaluate effective treatment options for burnout because currently there are no proven, fast-acting, and effective ambulant remedies.

Methods

We developed and evaluated a music intervention protocol that included listening to one of two specifically designed music programs (P1 or P2) twice daily for 30 min, 5 days per week, for the duration of 5 weeks. The placebo group was randomized to listening to unspecific nature sounds (PN). The waiting-list control group (K) did not receive any listening program during the evaluation period.

Study Design

The efficacy of the two music programs was investigated within a four-arm randomized, placebo- and waiting-list-controlled

double-blind study, including 150 participants, who had been diagnosed as suffering from burnout syndrome. At the beginning of the study, subjects participated in a baseline examination consisting of a clinical-psychological interview, self-administered questionnaires, and psycho-physiological measurements. Similar measurements were repeated at the end of the study period. Forty-five subjects were randomized to the P1 treatment group, 40 subjects were randomized to the P2 treatment group, and 26 subjects were randomized to the unspecific nature-sound control group (PN). These subjects were asked to follow the study protocol and listen to the music programs provided to them between study visits one and two. During this same period, the waiting-list subjects (K, $n = 39$) received no intervention. The average age of the participants was 49.4 ($\pm$ 12.8) years (75% female, 25% male). Changes in burnout symptoms were assessed by scores based on 41 self-administered questionnaire items which had been identified as relevant for the condition by comparison with different standard burnout scores (i.e., Oldenburg Burnout Inventory,[12] Maslach Burnout Inventory,[13] Fragebogen zum Burn-Out Zustand,[14] and Hamburger Burnout Inventar[15]).

Results

In comparison to the waiting-list control group, both the P1 and P2 intervention groups were observed to show a significant, positive effect in the reduction of burnout symptoms. The effect observed with the P1 program ($\beta = 0.25$, $P = 0.014$) was slightly larger than the effect observed with the P2 program ($\beta = 0.21$, $P = 0.039$). The placebo music program was not observed to have a significant effect. These relationships persisted through various iterations and approaches to model building.

Discussion

Within the study sample, the developed music programs were effective in reducing the symptoms of burnout after a relatively short five-week period of intervention. Considering the amount of time and cost involved with other forms of treatment for burnout, these specially developed music programs display a number of advantages. Furthermore, the music therapy appears to have had long-term effects as shown by qualitative in-depth interviews that were conducted every 3 months since the study's end. To date, all the participants have reported a sustained degree of stabilization and were able to maintain their level of psychological resilience.

In the course of our research efforts we have seen that this study is a salient example that the music programs and protocols (so-called I-MAT [Individualized Music-Focussed Audio Therapy]) developed for specific diagnoses have the potential to alleviate the disorders for which they were created. We have since completed a study testing our method with clinically diagnosed depression[16] and dysthymia and have seen significant outcomes. After 15 weeks of treatment, the reduction of the severity of depressive symptoms, as assessed by the Hamilton Rating Scale for Depression (HRSD),[17,18] was clinically significant and represents a decrease of more than 60% from the average HRSD score at the beginning of the study in 89% of the compliant study participants. The effects of the applied music interventions were also characterized by a significant improvement in the patients' subjective assessment of their quality of life.

Conflicts of Interest

Vera Brandes declares owning shares and acting in a supervisory role for SANOSON, the producer of the receptive music therapy. Joachim E. Fischer declares owning shares and receiving royalties from HealthVision Ltd., which was involved into the study design and drafting of the manuscript. All other authors declare absence of potential conflict of interest.

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