THE EFFECTIVENESS OF MUSIC THERAPY IN TREATING DEMENTIA

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What is Music Therapy?

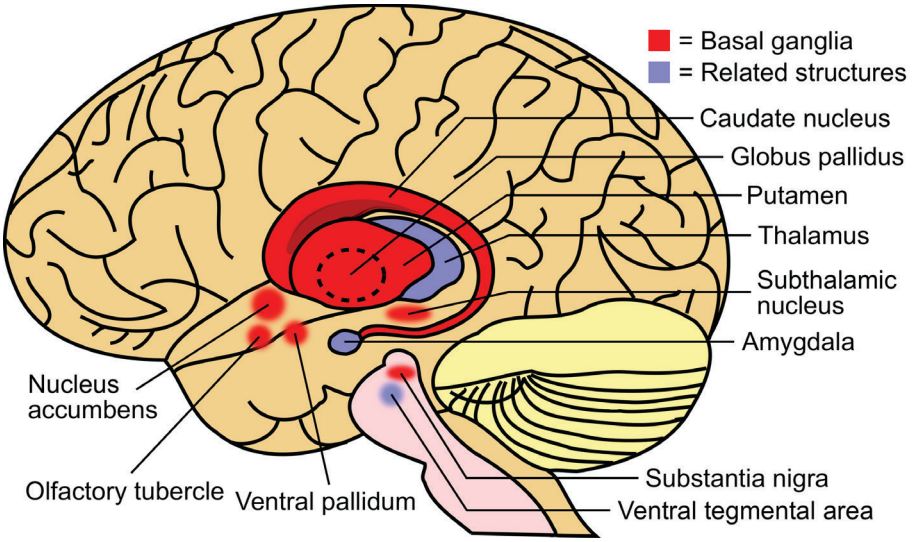
Throughout history, music has held a longstanding role in shaping one's identity. Whether people are consumed by the draw of poetic lyrics or with the emotions echoed in the rise and fall of a beat, music has compelled humanity for centuries and holds incredible meaning to many. Given how often and substantially we engage with music, many are urged to investigate not only what music means to us, but also how we can use music to our advantage. This quest is partially realized in the creation of Music Therapy, which employs a wide variety of different musical interventions to treat the emotional and cognitive disorders associated with dementia.[1]

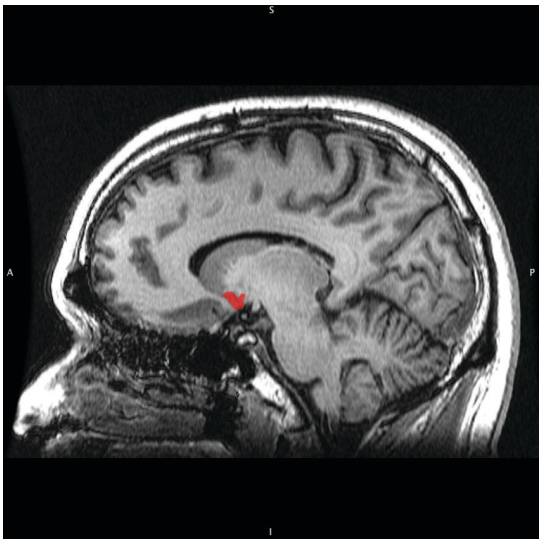
There are several types of Music Therapy, with methods ranging from the general support and improvement of certain behaviors, conducting dialogue through music in place of speech, and using music as a tool for memorization.[2] Music Therapy targets the mood and behavioral symptoms associated with dementia, such as depression, anxiety, and general agitation. As a memory aid, Music Therapy functions both as music-based mnemonics or in engaging with music important to patients during a significant time period in their lives. These are used to help patients connect with and strengthen their neural connections to specific memories. In other words, music has been shown to have the unique ability to aid in the general neuronal mechanisms for remembering new information.[3] Music Therapy taps into both the subjective experiential side of music and its more universal functions to produce positive results with dementia patients. Improvements are seen in their overall mood and demeanor, social life, and in aspects of their physical health.[4]

Music Therapy becomes an important part of the conversation surrounding diseases in which dementia is a common symptom, such as Alzheimer's Disease (AD) and Parkinson's Disease, which currently exist without a cure.1 In trying to determine the overall value and potential growth of Music Therapy as a discipline, something crucial to consider is if Music Therapy could play a part in a life-long prevention of the development of dementia—since there is existing research on how music itself has lasting health benefits of this degree, it is important to consider if Music Therapy has comparable or more expansive benefits.

Music and the Brain, Generally Speaking

Before delving into the efficacy of Music Therapy, it is useful to examine the incredible neurobiological mechanisms at work in the brain when one enjoys a piece of music. Music accesses several neurochemical systems as it is related to a broad spectrum of different emotions and sensations. An example of this is music's influence on the mesocorticolimbic system, the region of "reward, motivation, and pleasure," which is characterized by a mix of apprehension, goal-directed behavior, the expectation of achievement, the realization of achievement, and general





pleasure.[5] Studies have been performed using imaging technology such as positron emission tomography (PET) and functional magnetic resonance imaging (fMRI) to study both the awaiting and accomplishment of a reward. In several studies using PET scans, it was found that music deemed as pleasurable by participants incited a large increase in regional cerebral blood flow (rCBF) within the mesocorticolimbic system—most importantly, this indicates enhanced activity in the nucleus accumbens (NAc), which is found to be a critical system in reward processing.[4] There appears to be more activation in the rest of the midbrain when listening to familiar music, which may support a greater emphasis on the application of familiarity in Music Theory emphasis on the application of familiarity in Music Therapy. These results are further confirmed using fMRI, which observed activation in the NAc as well as dopaminergic interactions between the NAc and the ventral tegmental area (VTA), displaying that music subscribes to the same dopamine relationships caused by other perceived rewards.[4]

The significance of the relationship between music, reward, and the brain has its roots in historical human practice. The release of dopamine in the NAc has prompted various interpretations of how music operates as a reward, such as music perpetuating the desire of the human species to accurately predict events in order to survive; the act of predicting music is said to be exploited by composers in creating music, as one feels the reward of making a correct prediction.[6] This leads one to consider how Music Therapy has a distinctive value; if music activates the brain like other rewards, what makes music unique? Even further, what makes Music Therapy special?

In Perspective: The Benefits of Music Therapy

These neurochemical benefits of music can be coupled with social elements, enhancing certain disciplines of Music Therapy. Theoretically, these advantages can be due to the synchronization of rhythm that can be achieved in group music tasks such as drumming. This synchronization is valuable as it mimics the rhythm found in the performance of everyday activities such as walking or conversation.[7] These everyday routines are lacking in the environments of many dementia patients, as many report feeling a lack of belonging in their lives as their condition worsens.[8] Use of music in group settings has been found in some studies to be even more effective than individually-targeted music treatments, as three studies discovered that those who participated in group singing activities experienced a comparably sizable escalation in their salivary immunoglobulin A, which is an immunoglobulin protein that plays a large role in preventing infection.[4] Music has been demonstrated as stress reducing, contributing to a decrease in lifelong stress. Chronic stress is associated with increased vulnerability of the brain— this means that Music Therapy could help address the neurotoxic and cognitive deterioration associated with developing neurological disorders such as Alzheimer's.[4]

Furthering the discussion of the effectiveness of Music Therapy, a study was conducted using a form of Music Therapy referred to as Guided Imagery and Music (GIM) — classical music was used to activate patients' imaginations, who then explained their subsequent thoughts and emotions.[2] In the study, GIM was associated with a large reduction in cortisol and β-endorphin levels, which are hormones that increase with an escalated stress response.[4]

In general, listening to relaxing music featuring slower tempos and strategic pauses is shown to combat stress, as it slows heart rate, decreases perspiration, and reduces other physiological responses to stress.[9] Despite this fact, this study further emphasizes the function of Music Therapy specifically by pointing out that there was no benefit found in listening to music independently or in making interpretations of guided imagery independently; rather, change was only actualized when the music was paired with administrated guided imagery.[4] This emphasizes the importance of having a therapist component applied to music rather than relying on music-listening alone for effective treatment.

Future Directions

In the long run, there exists a clear need for more studies to be performed on the potential capabilities of Music Therapy. It is important to recognize that there are limitations inherent to this field of research, including how Music Therapy often cannot be measured independently—the separation of Music Therapy from other stimuli and treatments becomes subjective to each study, and to what diseases are endured by the participants. As such, the need to discover a more standardized framework for determining what success is in Music Therapy becomes more apparent, and this will hopefully provide more insight on this promising mode of treatment. Considering current findings, Music Therapy is at its least an effective resource of comfort for current dementia patients, and at its most, it is a long-term intervention promoting the health and efficiency of our brains. It is beautiful to think that the music we listen to today can be the very music that saves us tomorrow, yet reassuring to know that our connection to music is this pervasive.

Acknowledgement

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IMAGE REFERECES

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