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The Positive Effect Music Therapy Has on People

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Music Capstone Paper

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Abstract

The purpose of this paper is to explain the positive effect music therapy has on people. The paper will study and understand the role music plays in one's life. In order to do that, we will be looking at different ways music therapy is used on people through research papers and articles. We found that music therapy does have an important role that emits positive effects on people who have had a stroke, depression, or suffer from trauma, Alzheimer's, dementia, autism and Parkinson disease. This paper talks about how music therapy can be administered in these seven topics. It also explains the differences between psychological and physiological music therapy. One has to do with psychological life of patients with music being applied to them. It applies to depression, trauma, Alzheimer's and Dementia. Physiological has to do with the physical life of music therapy in certain cases like Parkinson's disease, stroke, autism and Alzheimer's. I am also looking at the similarities between psychological and physiological music therapy. By looking into these I am able to know what kind of music therapy would work for the patients. Psychological therapy could be administered with active or passive music therapy. Physiological can be mainly administered with passive music therapy, but there are some cases where active music therapy does play a part. I will be going further into the discussion about these types of music therapy.

INTRODUCTION

The winning award documentary film *Alive Inside* was released in 2014. It shadowed Dan Cohen, a social worker who brought music to people with dementia in nursing homes. Cohen asked a documentary film maker to follow him around for three days to witness his work and introduce people to the astounding effects that music has on mood, the behavior and the quality of life of patients who appeared to no longer be able to have a connection to themselves and the world. The filmmaker was very impressed, and moved that he decided to follow Cohen for months and create the film *Alive Inside*. Cohen's method is very simple; he asked the family of each nursing home resident to list songs or instrumental pieces the person once enjoyed. He then creates an individual playlist on an mp3 player for the resident to listen to. The music ranges from jazz, to rock to classical and brings surprising reactions from the residents and their families. Some of the residents who seemed unable to speak began to sing and dance to the music, others were able to recount to when and where they had listened to that specific song. The music seems to unlock the doors into the resident's conscious memory vaults. There is growing evidence that explains why people in the film came back to life and begin to feel like their former selves when they listen to the music. Two recent studies in Japan and the United States found that music does not just help retrieve stored memories; it also helps create new ones. In these studies, healthy elderly people scored better on a test of memory and reasoning after they completed several weekly classes where they were assigned moderate physical exercise to musical accompaniment (Lisa Wong, Nadine Gaab, and Gottfried Schlaug; 2015). Researchers from the Music and Neuroimaging Laboratory at

Harvard University showed that singing lyrics can be very helpful to people who are recovering from a stroke or brain injury that damaged the left side-brain region that is responsible for speech. Singing lyrics has the ability to resonate in the undamaged right side of the brain, which then helps people learn how to speak their thoughts by singing them first, and then gradually dropping the melody (Katie Misses et. al., 2011). The former Representative Gabrielle Gifford's used this technique to learn how to speak before a congressional committee two years after a gunshot wound to the head damaged her ability to speak (Katie Misses et. al., 2011). As supported by this article singing also helps people learn words and phrases faster.

Music Therapy

Music therapy is a new method used to treat people, and it isn't well known to society. We will be looking into studies and research demonstrating the positive effects of music therapy. Music therapy can be an effective method in relieving stress and treating patients who suffers from trauma, Alzheimer's, dementia, stroke, and Parkinson's disease. Multiple studies have shown that listening to supportive music during therapy improve motor rehabilitation of stroke patients" (Yanna Tong, et al., 2015). The studies showed they did improve the motor function of post-stroke patients, but researchers aren't clear about the effects of the mechanism behind it. It is certain that the result of combined repeated practice with musical stimulation does improves motor rehabilitation of stroke patients. A few studies were also designed to clarify the difference by presenting music as an independent factor. The study of stroke victims included thirty-three participants who were not musically inclined and other participants were either assigned to audible music or mute music groups which

“permitted observation of music’s independent effect.” All the subjects who participated received rehabilitation treatment. The music group participants were given 20 extra sessions of audible music instrument training for over 4 weeks. The controlled mute musical group received the same music instrument training. After 4 weeks, all remaining participants showed significant improvement however, they found a significant difference between the two groups, which meant that the music group had a greater improvement. This study suggests that music has an important and unique role in improving “upper limb motor function” for stroke patients (Yonna Tong et.al., 2015).

Listening to Music

Music therapy is known to restore and maintain mental health as well as to aid in psychological, physiological, emotional and spiritual health during the treatment of an illness or disease. Music therapy is divided into two different parts and they are known as active and passive music therapy. Active music therapy involves both therapist and patient’s singing and playing musical instrument. Passive music therapy is involving the patient laying down and visualizing peaceful image while the music therapist plays calm music. The main goal of passive music therapy is to build a state of mental relaxation. Numbers of clinical studies were conducted to research the effect of music therapy by using clinical variables. Patients were studied in various care settings using forms of “musical intervention” (Ae-Na Choi, Myeong Soo Lee, and Hy un-Ja Lim, 2008). These conducted studies showed that “music therapy is beneficial for anxiety, tension, stress reduction or mood enhancement” (Ae-Na, et al., 2008). Music therapy is used during psychotherapy in some patients with certain conditions. Several studies have brought to light that music therapy is very effective for patients with dementia.

Dementia is a neurodegenerative disease that deteriorates the memory, language, personalities, emotion, ability to reason and behavior of those who suffer from it (Beer, Laura E, et al., 2017). Dementia is very devastating to a person because they lose the ability to think, respond and remember. Advanced stages of dementia take away one's ability to recognize oneself and sufferers do require a caregiver for emotional support. Many caregivers are unaware of about the methods for taking care of a patient who does suffer from dementia. The caregivers are unable to approach, talk to, or engage with a person with dementia or advanced dementia, yet universal techniques are taught and learned (Beer et al., 2017). An educational model that teaches caregivers how to prolong meaningful interaction with patients who suffer from dementia is very important to create a meaningful interaction with patients. By interacting with the patients who suffer from dementia care givers can help their patients feel needed and retain a sense of self-worth.

Music therapy can be used for patients who suffer from dementia. Studies in medical and geriatric journals have also shown that antipsychotic drugs should be used as a last resort for disruptive behavior and patients with dementia (Beer et al., 2017). Music therapy is very effective in helping patients manage behavioral symptoms like anxiety, aggression, agitation and withdrawal. A questionnaire in an Austrian study asked about which kind of therapy would be effective and music therapy was among the treatments most used. The study showed that music help soothes and calm the residents in nursing homes; music also created an environment that was upbeat and positive for each of the nursing homes. The positive effects include a decrease in medication and anxiety and an increase in life quality for the patients (Beer, 2013). Another experimental study showed how music therapy helped

decreased anxiety of patients with late-stage dementia that music has an effect (Beer, Ridder, Stige, Oyale, and Gold 2103; Suzuki et.al., 2004). A review led by Sung and Chang (2005) was about the use of music to decrease anxiety. Their review concluded that there was an increase in the sense of a familiarity which also produced an increase in relaxation. The study showed that elevated areas of the brain are not impacted with dementia. It also suggests that music is a form of communication that does still stay intact with the patients. The review showed that music therapy was an inexpensive way to manage the patient's behavior. Music therapy is poorly written or offered as a daily interaction between patients and caregivers because most people aren't informed about music therapy. (Beer et.al., 2012). Patients with dementia are isolated and it is very devastating for them because they crave a sense of belonging, friendship and to be understood. Music therapy gives them this meaning; it helps them feel more and express more by tapping into their emotion and memories. Music therapy should be demonstrated to the caregivers; a simple humming of tunes and singing will be helpful for the patients. It is also a way to improve communication with patients who suffers from dementia. The patients are also able to become more active and participate in the nursing homes which increases a positive interaction between the nurse and the patients who suffers from dementia.

Music therapy can also be administered by parents, siblings, relatives by singing tunes or humming a song that are familiar to the patients. It does help soothe the patient and will help them gain confident in their ability to take care of the patient. It doses also livens the place and make them feel like they aren't going crazy.

Listening to music is considered one of many techniques that can be used for music therapy by *the American Music Therapy Association*. Listening to familiar music is reported to be very beneficial for those who are recovering from stroke. Music therapy is also used to “reduce acute and chronic pain in conjunction with other palliative methods” (Ae-Na, et al., 2008).

Passive and Active Music Therapy

Passive and active music therapy are some of very important methods used to engage with the patients. They both correspond with each other but have different duties regarding the treatment they are being used for. Their music activities differ in which parts of the brain they activate. For passive music therapy, patients to be listening to live or recorded music. Passive music therapy then engages the subcortical (surface of the brain below the cerebral cortex) and the cortical (outer layer of the neuron tissue of the brain which is separated into two cortices that divides the cerebellum into the left and right hemispheres) areas of the brain. Studies have shown that patients who suffers from Alzheimer’s and dementia are able to recall parts of their memories through passive and active music therapy. The significant aspect about this is that the brain is able to form new cells that won’t be affected by dementia or Alzheimer’s. Initially, what happens is that the brain is producing more resilient cells can’t be destroyed by those diseases.

The link between music and cognitive function includes the temporal order of learning, spatiotemporal reasoning, attention, and auditory verbal memory (Michael H Thaut et.al., 2009). Efforts have been made to understand how music can activated cognitive function. A study was mainly conducted on musical attention and rhythmic patterns, and the study found

evidence for divided attention between processing of lyrics and processing of music (Thaut et.al., 2009). A very important connection was discovered between musical and nonmusical formations. The research by Deutsch (1982) showed how the fundamental organizational processes for memory formation in music. Structural principles of phrasing, graphing, grouping and hierarchical abstraction in musical patterns have their parallels in temporal chunking principles of nonmusical memory process. This mainly means that parts of our brain are able to function and form memories. The brain could also recall, graph, group and chunk the memories in certain criteria. This was also a very important step and process in the link between music and cognitive formation. The research about “Cognitive Processes in music like for example memory and attention” also brought attention to musical chunking being used to enhance verbal learning and to rehabilitate verbal memory. The Rational Scientific Model (RSM) was mainly developed for to provide a systematic knowledge for translational research in music and rehabilitation (Thaut, 2009). The researchers asked “could attention training in music enhance auditory attention control in nonmusical con-text based on principles of attention process training? “Questions likes these arise to get a better understanding in musical rehabilitation. It helped strengthen the researchers’ hypothesis, which opened more doors and possibilities.

Research showed that music is an effective way to accelerate verbal learning and recall in a healthy people, patients with memory disorders and children with learning disabilities (Thaut 2009). One theoretical model suggested that highly developed structure in musical songs, chants, rhymes, functions as a device to help organized and chunk them. By chunking them one is able to access this information across the nervous systems. Research does show

that musical memories are more likely to survive than nonmusical memories. People who suffers from dementia or Alzheimer's are able to accesses these functioning memories.

Musical memories can also extend and help people who are diagnosed with AD, Anterograde and Retrograded memory deficiency. These people are able to perform familiar music and learn to play an unfamiliar piece. These discoveries are also very useful to help patients for musical therapy. Emotional context and positive state of mind are able to enhance learning and memory recall as well (Thaut 2009).

Music and Stress

Many researchers have wanted music to be recognized widely as an effective therapy in treating certain physical and mental illnesses and as an effective outlet for emotions. Daniel J. Levitin introduced the idea of using a song's sound frequencies to treat physical ailments. It is a very new field and Levitin, who teaches neuroscience of music at McGill University in Montreal, will be testing his idea. Other recent studies are pushing the benefits that music has on mental and physical health. In a meta-analysis of 400 studies, Levitin and his postgraduate research fellow Mona Lisa Chanda discovered that music reduces stress and improves the body's immune system function. They also indicated that listening to music has proven to be more effective than prescription drugs in reducing anxiety before surgery. This discovery changed the perception of music and brought it closer to the medical field. There can now be deeper research done to discover new ways music can be useful for patients. Levitin wrote a book *This Is Your Brain on Music*. This book went into detail of the medical effects behind music. Levitin's book's research also found that listening to music increases the body's

production of antibodies and immunoglobulin A. It also states that music reduces levels of the stress hormone cortisol.

A study was recently conducted on the link between music and stress, and it stated that music can help soothe pediatric emergency room patients. 42 children of age 3 to 11 were tested in this trial. The researchers at the University of Alberta found that patients who listened to relaxing music while getting an IV inserted reported less pain; some also showed signs of less distress compared to the patients who did not listen to music while getting an IV inserted. In addition to the group who listened to music, two thirds of the health care providers reported that it was easier to administer the IV. The music did help calm the patients down and gave everyone in the group who listened to music a satisfying feeling about receiving an IV (Jama Pediatrics, 2013).

There are other cases where patients were tested by playing music to some cancer patients while they were lying in bed. The rapid shift of their moods due to the music was amazing. The patients were able to show signs of positive and cheerful moods. It brought hope to the patients and their family members. Scientific evidence shows that the brain responds to music in very specific ways. Lisa Hartling, the lead author of this study and a professor at the University of Alberta says that there is growing scientific evidence that describes the specific way music makes the brain respond.

Music and Memory

Some patients who comes in with retrograde amnesia due to their brain not being able to remember past memories, has been helped by music therapy. They are able to keep potential memory intact and can form new memories. Tests when done to see if listening to

certain music that had a strong emotional ties to their lives would help retrieve those memories. It did help the patients recall glimpses of their past. It's more like pieces of their memories are being formed due to the music and eventually they are able to recall everything. It does takes time but the test was proven to be very effective (Music and Memory 2017). There are also cases of patients with anterograde amnesia, which is the loss of the ability to create new memories after the event that caused the amnesia. There is still more research being done about anterograde amnesia.

The film *Alive inside* talked about different cases of music used on elderly people who suffers from Alzheimer's. Henry, profiled in the film, had dementia and he needed to be constantly watched and supervised. When Henry was young, he would sing music every day to his kids and goof around. Now, Henry doesn't really recognize anybody and he is mostly in a trance (spaced out most of the time, not really present). Henry didn't really talk too much to people; he was isolated from the world. He sat quietly on his wheel chair with his head starring down at his hand. One of Henry's helpers played one of Cohen's music playlists to Henry. He became his alive: communicative, singing to the music and moving his body to the beat on the wheel chair. Henry waking up for the first time did something to everybody and everyone in the room could feel it. Music was once called a quickening art by the philosopher Kant, and the music brought Henry quickly to life. You could also tell that if he was asked a simple question he could easily answer and remember his past very vividly. He also remembered the lyrics to his favorite song "I'll Be Home for Christmas." Henry was able to reacquire his identity from listening to music. Dan Cohen was able to connect with Henry and

get a better understanding of who Henry was and about his past. Music is seen and known as a back door into the mind for those with dementia.

Music records itself in our motions and emotions when we are young, and those are the last parts of the brain that are not touched by Alzheimer's. Specifically, for patients with Alzheimer's, it has to be music that has meaning to them so they are able to correlated the music emotions with memory and feeling. To the researchers, music was a new field to study but it had so many interesting facts and knowledge that people are unaware of. To the researcher's and those who have family that suffers from dementia and Alzheimer's music is a path to awaken another person to what they are or who they used to be and what they could be. The part of the brain that is involved with remembering and responding to music is not affected too much in Alzheimer's disease or other dementias. A main of the reason why musical memories are so strong has a lot to do with the way music enters our brain. Music has the ability to reach more parts of the brain than any other stimulus. Music is a cultural invention that makes use of parts of the brain developed for other purposes. Music not only uses the auditory part of the brain; it also uses visual, emotional, and, at the lowest level, in the cerebellum (*Alive Inside*).

The Use of Music

As we now know, music can affect the brain and a few of its many functions. Music can also be used to help the heart and circulation, and one way of reducing stress is music. A Wisconsin study evaluated 45 patients who suffered from heart attack within 72 hours. Many patients were in an intensive care unit but were stable clinically. They were assigned to listen to classical music or continue their routine care. They were all monitored closely during the

20-minute trial. As the music began, the patients who listened to the music had a drop in their heart rates, breathing, and their heart's oxygen. Music had no effect on their blood pressure; however, all the patients were given ACE inhibitors, which lower blood pressure on their own. After the music stopped, the cardiovascular improvements linked to music lasted for an hour and psychological testing demonstrated lower levels of anxiety. For heart attack victims short term improvement are welcome. These studies also show that music helps the heart and circulation and also the circulation of blood to the brain by slowing heart rate, lowering blood pressure and reducing stress levels hormones. Scientists also did a study on arterial function and blood flow. With the 10 healthy volunteers, the researchers found that joyful music produced 26% increase in blood flow (Amy Novotney, Music and Medicine 2013).

Music Therapy Administered for Kids and College Students

A simple thing that can make a big difference is playing music for kids to help them during painful medical procedures. It gives them a different impression of hospitals, and they are less likely to be afraid. Music is also used on adult patients; research was tested on this topic at Khoo Teck Puat Hospital in Singapore. Patients in palliative care took part in a live music therapy session, and they reported relief from persistent pain (Cheri Lucas 2003-2017). The music therapist worked closely with the patients to tailor their intervention individually. The patients took part in singing, playing instruments, discussing lyrics and song writing. While doing so, that they were able to accept their illness or life-ending issues. Due to the patients engaging in live music they were able to reconnect with their healthy life even when they were faced with "unbearable conditions or disease related suffering." Melanie Kwan, the music therapist who was the co-author this study said that their acute pain symptoms were

relieved and the patients were finally able to rest.

Autism

Autism is an early childhood mental condition which causes difficulty in communicating and, forming relationships with others. A child or person with autism shows restricted repetitive behavior, interest and activities. Music therapy can be very helpful for kids and adults with autism; it is a way to break the barrier and communicate and socialize. Music therapists observe the child with autism interact with others in a social environment. then they help in building a connection by playing music. Music therapy is very important for a child with autism because it creates a positive environment for the child. The child is able to create a bond, and this helps the child socialize with others. Music therapy also has an impact on the child's motor/sensory, and academic/ cognitive function. The National Autism Center (2009) recognizes music therapy as an emerging practice.

Sounds Used to Treat Parkinson's Disease

Parkinson's disease is not fatal disease but it does ruin the capability to enjoy life's riches. Treatments are effective but are unable to alleviate symptom or slow the progression of the disease. The drugs that are used for Parkinson's disease do come with side effects that causes neurological and psychiatric disturbance. A research study was conducted by Bernatzky et al (2004) demonstrating music influence on motor coordination in patients who are affected with Parkinson's. Music is known to help people move and get out of bed in the morning: "it also helps patients enact a specific physiological movement like walking." In order to physically move the rhythm must be encouraging with familiar music that can allow the therapy session to be moved outside/outdoors. Certain elements of music have an effect on

the motor system, and, after three weeks of music therapy, patients with Parkinson's disease demonstrated an improvement walking speed and distance by 25%. The data showed in the research confirms how effective auditory rhythm improved speed though "rhythmic coupling of auditory and motor systems." It also indicated that special music can significantly elevate the dopamine levels and some neurotransmitters (also known chemical messengers that enables message to be transmitted to the neurons). The study also showed the progress patients made by listening to music. The researchers expected a decrease in the performance of patients where not mediated. The result showed that the patients were able to easily move with the music and rhythm.

The brain

Music enhances memory by using tunes to stimulating many areas of the brain, including the hippocampus, which the section that oversees the area of long term memory. Music helps enhance memories by reincarnating feeling and emotions related to the tunes through the hippocampus. The hippocampus is "the elongated ridge on the floor of each lateral ventricles of the brain, it is thought to be the center of the emotion, memory, and the autonomic nervous system." The hippocampus only has long-term memory; the hippocampus is not associated with short-term memory (working memory) or procedural memory (it the memory about motor actions like walking). Scientists are unsure exactly how this occurs. The hippocampus seems to play a major role in declarative memory, the type of memory involving things that can be purposely recalled, such as facts or events.

The human brain consists of different parts and they all function for differently but are connected. The brain stem controls the flow of messages between the brain and to the rest of

the body. It is also used for breathing, swallowing, heart rate, blood pressure, consciousness and also to know whether one is awake or sleeping. Music triggers certain sections in each part of the brain which has a lot to do with memory, and these topics: stress, trauma, dementia, Alzheimer's and autism.

The brain is an important part that demonstrates the connection of music to the mind, body and health. Music is a necessity for us to use, and it does so many wonders that we don't account for. Some might be small, but it never ceases to amaze us, and the big ones leave us with the joy of a new beginning. Music can provide a beginning of getting to know oneself better, understanding who we are, and healing loved ones, and people. This paper's main purpose was to inform readers about the positive effects of music with patients who suffer from diseases like Trauma, Alzheimer's, Parkinson's disease, dementia, stress, depression, Autism. This paper talks about and explains how music therapy can be administered to the patients. It also advises nonmusical therapists, care givers and nurses methods in dealing with patients who have these diseases. If you know anyone or a family member who does suffer from these diseases please read and listen.

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