

Understanding the Use and Usefulness of  
Music Therapy

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### **Abstract**

Music's use in achieving therapeutic ends is well documented and it has been used as such for centuries. Music therapy is the most modern form of this and is defined as a structured, systematic use of music or musical elements such as harmony by a qualified music therapist to meet physical, emotional, social, mental, and cognitive needs. Music therapy is a versatile practice; it can be done in individual or group settings, and has over a hundred official techniques that can be used to apply it. Since the practice is so versatile, it has been applied across a wide array of disorders and ailments, such as: depression, autism, aggravation in dementia patients, and more. Each condition of choice has been evaluated in multiple ways in multiple studies. Results overwhelmingly show that music therapy is effective in reducing difficult symptoms.

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### **Statement of Original Authorship**

The work contained in this thesis has not been previously submitted to meet requirements for an award at this or any other higher education institution. To the best of my knowledge and belief, the thesis contains no material previously published or written by another person except where due reference is made.

Signature: \_\_\_\_\_

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## Acknowledgements

## **Introduction**

Music has been regarded as important to the wellbeing and existence of human beings for ages. Charles Darwin hypothesized that music has been around since the dawn of man, and was even a protolanguage at the time (Cervellin & Lippi, 2011). The idea that music and health are related or even linked together is an old idea as well, but can be traced to a time not as long ago. Over 2500 years ago lived a man named Pythagoras, whom many school children know because of the Pythagorean Theorem. Pythagoras deserves credit for more than just that, however, and his studies of music are definitely one of the reasons why.

Pythagoras was both a mystic and a serious scientist; he saw the universe as having supernatural properties that could be scientifically discovered and tested. Pythagoras, along with many people at the time, was convinced that the human being existed on three main levels: mind, body, and spirit. Not only that, but the universe as a whole existed due to vibrations; planets vibrated, stars vibrated, everything vibrated like the music played on Earth. These vibrations cannot be heard, but according to Pythagoras the vibrations are something humans can channel and meditate on. He then implied that the vibrations we can hear (audible music) must have an effect on human consciousness and spirit just like the universe vibrating, and can even align the three levels of existence mentioned earlier. (Wigram, Pederson, & Bonde, 2002).

Pythagoras was so fascinated by this that he desired to not just observe but test these principles. To do so, he created his own vibrations on an instrument/measuring tool he invented called a “monochord”, which was essentially a string-instrument with only one string. This string allowed for the experimentation of notes and intervals which could then be tested in regard to

their effects on human consciousness. Many of his theories formed from this very tool, one of which was his theory on the relationship between tone and interval (Wigram, Pederson, & Bonde, 2002).

This was the foundation for music theory for centuries. Throughout the Middle Ages, university was divided into the trivium, which included grammar, rhetoric, and logic, and quadrivium, which was divided into geometry, arithmetics, astronomy, and— interestingly--: music theory. Music theory of the time clearly made a distinction between music on a spiritual level, mind level, and bodily level (just like Pythagoras hypothesized). Just as clearly divided was what influenced human health at the time, the four “humours” which were: blood, phlegm, yellow bile, and black bile. Diseases were thought to have occurred because any of these were off balance, and multiple studies at the time argued that music can be used therapeutically in a situation such as that. Not only could it help influence the balance of all four, but it could even restore the balance completely (Wigram, Pederson, and Bonde, 2002).

All though Pythagoras studied music scientifically, and music theory was taught in schools, nobody had a plausible explanation as to why music had the health benefits that it had (Wigram, Pederson, & Bonde, 2002). One popular explanation amongst the ancient Greeks and Assyrians was that music helped humans through magic. (Cervellin & Lippi, 2011). This “magic” was believed to be able to be used to remedy very specific ailments. It was even used before the Olympics to boost the strength of athletes (Magnus, 2010). In 1632, Robert Burton wrote in his very popular book The Anatomy of Melancholy that music was a great remedy for sadness and fear. Music was understood to influence the human mind, body, and spirit, but this

understanding was rarely attempted to be strengthened through scientific investigation (Wigram, Pederson, & Bonde, 2002).

Throughout the Middle Ages, music theory would remain unscientific and unexamined (as did most things at the time). That's not to say it wasn't important or found to be useful, but people didn't question why that was the case too deeply. This was true until relatively recently. In the 1900's, people decided to revisit some old ideas with new information. Many questions once asked were being asked again, and one of those questions certainly was "can music help me feel better?". Music medicine was put under the spotlight at first, with studies like O'Neil Kane's in 1914 for example which deemed music as a credible way of helping the anxiety of patients undergoing surgery. A lot of studies at the time stated they experimented with music therapy, but in fact it was music medicine that was being used; they merely looked to see if listening to certain types of music had effects on things such as fear, anxiety and depression (Howland, 2017). Regardless of technique, philosophy, or intention of research, one thing was clear by this point in time: music is powerful and can affect the mind in positive way.

As time progressed and organizations such as the World Federation of Music Therapy formed, a need for formal techniques and definitions arose. Definitions of music therapy are still debated today, but for the purposes of this paper I will use the one settled on by the World Federation of Music Therapy: "Music therapy is the use of music and/or musical elements (sound, rhythm, melody and harmony) by a qualified music therapist with a client or group, in a process designed to facilitate and promote communication, relationships, learning, mobilisation [sic], expression, organisation [sic] and other relevant therapeutic objectives, in order to meet physical, emotional, mental, social and cognitive needs. Music therapy aims to develop

potentials and/or restore functions of the individual so that he or she can achieve better intra-personal and inter-personal integration and, consequently, a better-quality life through prevention, rehabilitation or treatment.” (WFMT 1996).

Many models of music therapy have arisen as time has progressed, and they vary quite a bit. The Nordoff-Robbins style, also known as creative music therapy, uses music as the therapeutic catalyst that enables change; Music as therapy is different from music in therapy, in which the music is more of a tool used to create a therapeutic connection or method of expression instead. This model of music therapy may be chosen to be used with patients who have trouble speaking for example, because the act of making music brings up emotion and thought, making it easier to express. Other social disorders may be aided by this model as it plays to certain developmental categories such as speech, language, and cognition (Howland, 2017). This style of music therapy, in which the patient is an active participant in the making of music, is classified as active music therapy (Wigram, Pederson, & Bonde, 2002).

Receptive or passive music therapy, on the other hand, involves a less hands-on approach for the patient. In this style, the therapist uses music more as a means of directing the patient’s train of thought, and less as a method of communication or expression. A fine example of this is the Bonny model of music therapy. Helen Bonny made a model of music therapy that took the patient on a journey through multiple stages of music listening, and communication, the patient’s train of thought is conducted by the therapist to allow for introspection and reflection by the patient (Howland, 2017).

Since music therapy can be done in multiple ways, the techniques used to employ it have been toyed with a lot. Through modifying techniques, researchers started gathering ideas about

areas that music therapy may benefit. Music therapy has been applied to a plethora of situations. It has been used on people who merely want to discover more about themselves and their thoughts, but it has also been used as a serious method of treatment for symptoms across many disorders. The latter concept is what will be discussed at length in this literature review.

## **Literature Review**

### **Depression**

Depression is becoming a more serious topic as mental health awareness increases. From television commercials to bringing it up in health class, depression is becoming a topic taken more seriously than what it once was. Depression is not a simple thing to understand, and there are multiple types to study. The DSM-V lists eight depressive disorders, some of which include: major depressive disorder (including major depressive episode), substance/medication-induced depressive disorder, and persistent depressive disorder (dysthymia) (American Psychiatric Association, 2013). Criteria for depression disorders vary quite a bit but also encompass the same basic symptoms such as empty mood and irritability. Major depressive disorder, for example, requires the aforementioned empty/depressed mood to be present almost daily for two weeks, whereas Dysthymia has the same criteria but the timescale jumps from two weeks to two years (American Psychiatric Association, 2013).

Depression comes with its physical symptoms as well and is not relegated to being purely a mood disorder. Lethargy and sluggishness can plague certain depressed peoples and make going about their day incredibly difficult. To combat the many symptoms of depression, many routes can be taken. One route is the pharmacological approach. There are a multitude of antidepressants out there as evidenced by the growing volume of ads for antidepressants (e.g., Abilify). Every one of these pharmaceuticals comes with a risk of having unintended side effects that can cause great harm or discomfort to the user.

Multiple non-pharmacological treatments exist for depression as well, and are sought out in order to reduce or eliminate the chances of experiencing side effects. For example, cognitive behavior therapy (CBT) is one method of treatment for depression and is generally considered to be a quite effective short-term solution due to its efficiency (McGinn & Sanderson, 2006). It's focused on creating connections for the patient and allowing a greater understanding of their own thoughts and what fuels them, so that way they can change the fuel and produce new thoughts. Another treatment, mindfulness cognitive behavior therapy (MCBT), is a newer behavior therapy and is more focused on acceptance. Like CBT, it creates an awareness of issues, but the difference is that through techniques such as yoga, the patient is made to accept these flaws rather than change them. (Tovote et al., 2017).

Music therapy has long been thought to help aid the symptoms of depression. A randomized controlled trial conducted by Erkkila, Punkanen, Fachner, Ala-Ruona, Pontio , Tervaniemi, Vanhala and Gold (2011) aimed to see if improvisational music therapy would aid depression symptoms in a one-on-one scenario. This study consisted of 79 participants, aged 18 to 50 years old, and were only included if their depression was their primary diagnosis had to meet ICD-10 classification (World Health Organization, 1992). Participants were excluded if they did not meet the inclusion criteria, or if they had repeated suicidal behavior or psychosis, acute and severe substance abuse, or depression so severe they couldn't participate (Erkkila et al., 2011).

The experimental group received improvisational music therapy in which both therapist and client used the same instrument to freely create music based around certain thoughts, emotions, and feelings of the client. These sessions were held twice a week and were 60 minutes

in length. The researchers had set up a total of 20 sessions but were aiming for at least 16 of them to be completed by the participants. During the trial, they received this music therapy in conjunction with their pre-existing treatment as usual, such as medications or counselling received prior to this study. The control group received only treatment as usual (Erkkila et al., 2011).

The outcomes of the trial were promising. The primary outcome measured was the Montgomery-Asberg Depression Rating Scale (MADRS), which is a scale consisting of ten items that can be scored for a total of 0 to 60 points. The results showed more positive change in MADRS scores in the experimental group than in the control group, indicating that music therapy in conjunction with treatment as usual was more effective in treating depression than treatment as usual alone. Another interesting find was that an average of 18 out of 20 sessions were attended, which shows a high level of client engagement and involvement (Erkkila et al., 2011).

Chu, Yang, Lin, Ou, Lee, O'Brien, and Chou (2014) sought to find similar results but with group music therapy instead of an individualized approach. What makes this study unique is the participants all have dementia and depression. Their randomized control trial consisted of 104 elderly patients. Participants were eligible to be included if they had an onsite diagnosis of dementia based off the DSM IV, had depression, were 65 years old or older, and had no significant hearing impairment. Exclusion criteria were participants participating in another research program, having receptive language problems, or having an inability to participate in the experiment for over thirty minutes (Chu et al., 2014).

The experimental group in this trial received two thirty-minute sessions of active and passive music therapy per week for six weeks. The intervention methods and activities were consistent for series of two sessions in a row, and varied from singing to instrument playing to music listening. Depression was measured on the Cornell Scale for Depression in Dementia (CSDD), and cortisol (a stress hormone) levels were measured as well as a biological marker for changes in depression. The experimental group received no usual care and was limited to music therapy during the trial. The control group was the opposite and was limited only to treatment as usual (Chu et al., 2014).

The results of this study were promising as well. Depression was shown to be lowered through the scores taken pre, during, and post-trial. Part of this could be because music is a distraction; listening to and focusing on music requires one's mind to drift away and become distracted from any prior feelings and thoughts. Another contributing factor surely was choice of music played; music taste and preference of each participant were taken prior to the trial, and listening to familiar is an even better distraction than music one does not like (Chu et al., 2014).

Since music therapy is a versatile method of treatment, it would be appropriate to intentionally test whether various methods are more effective when compared to others. In a study conducted by Atiwannapat, Thaipisuttikul, Poopityastaporn and Katekaew (2015), active and passive music therapy were tested against both each other as well as a control group. The 14 patients were all outpatients aged 18 to 65 with an ICD-10 diagnosis of major depressive disorder. They also needed a score of  $\geq 7$  on the Montgomery-Åsberg Depression Rating Scale (MADRS) Thai version (Kongsakon, Zartrungpak, Rotjananirunkit, & Buranapichet, 2003). Anybody who had severe depression and repeated suicidal/psychotic symptoms or need

hospitalization, substance abuse/dependence, hearing or communication problems, or treatment with psychotherapy or electroconvulsive therapy was ineligible for participation (Atiwannapat, Thaipisuttikul, Poopityastaporn, & Katekaew, 2015).

The experimental groups both had 12 weeks of once-a-week hour-long sessions of music therapy. Each of the active MT group sessions began with group singing, followed by: choir playing, then song writing with group performance, followed by percussion improv, then everything was concluded with group singing and instrument playing. Every one of the passive MT group sessions started with music listening, followed by vocal lyrical analysis, then song writing facilitated by the therapist, then the participants drew while listening to music, and the session concluded with relaxation and music listening. Both groups were allowed to continue any medications or see any psychiatrists they were seeing prior to the trial. The control group also received 12 weeks of once-a-week hour-long sessions, but instead of music therapy it was group counselling focused on problem-solving and the improvement of coping skills (Atiwannapat, Thaipisuttikul, Poopityastaporn, & Katekaew, 2015).

Measurements of depressive symptoms were taken at baseline, 4 weeks into the study, 12 weeks into it, then another 12 weeks after the study had concluded. Comparing the 3 latter measurements to baseline showed that depressive symptoms had decreased. Not only did they decrease, but they decreased for both experimental groups (the amount, however, was not statistically significant). These positive effects were even apparent in the final measurement taken 3 months after the test's conclusion (Atiwannapat, Thaipisuttikul, Poopityastaporn, & Katekaew, 2015).

Another comparative study conducted by Werner, Wosch, and Gold (2015) compared the effects of active group music therapy to simple recreational group singing on the depressive symptoms of elderly people. Some people believe that if one listens to music for therapeutic reasons then music therapy was conducted, however, this is false and such falsehood is evidenced in the study's findings. The study consisted of 117 participants with 62 in the MT group and 55 in the recreational singing group. Anybody with depression over the age of 65 could participate as long as they weren't bedridden (Werner, Wosch, & Christian Gold, 2015).

The interventions for the MT group were very flexible and not very structured for the purposes of creating a customized approach for the participants. The sessions consisted of any number of combinations of group singing (Clark & Harding, 2012), receptive music therapy, instrumental improvisation and dance/movement. The aforementioned MADRS scale was used to measure depression and the interventions were 40 minutes long and happened twice a week for 12 weeks. The control group met once a week for the same 12 weeks and merely sang as a group for 90 minutes (Werner, Wosch, & Christian Gold, 2015).

The findings of this study do support that therapeutic music listening is different from music therapy. This particular study shows that the depressive symptoms were significantly reduced in the MT group to a greater extent than the recreational singing group. The MT group saw improvements in concentration difficulties, lassitude, inability to feel, pessimistic thoughts and inner tension in particular. Some of the older patients had dementia and while MT helped everyone, a post hoc analysis showed that patients with dementia were aided more greatly. This study did not examine long-term effects of the MT and group singing which is an unfortunate limitation of this study (Werner, Wosch, & Christian Gold, 2015).

Group music therapy has been extensively researched as a treatment method for depression, and this could be due to the unique group interactions created in an environment such as that. Group interactions are important in all stages of life, but in college the social pressure coupled with every social interaction is incredible. College students with depression are liable to withdraw from group settings and activities, or never even place themselves in one to begin with. Those reasons are most likely why researchers Jinliang Wang, Haizhen Wang, and Dajun Zhang used group music therapy when researching its effects on depression on college students in 2011.

Their study had 80 participants, 40 of which were in the music therapy group while the remaining 40 were in the control group. Students were eligible if they were in college, had a self-rating depression scale score greater than 40, and a score of depression factors of SCL-90 greater than 2.18. The experimental group's entire intervention was divided into 3 stages. Stage one was the introduction stage, which was designed around gaining and honing social skills to help with the symptoms mentioned earlier. The second stage was the implementation stage, and consisted of: relaxation training, attention training, rhythm and movement training, music-painting training, and adaptative cognition training. After each of these training sessions participants wrote down their achievements of the session. The third and final stage was the conclusory stage and was simply reminding the participants of what they learned and how to apply it outside the study. The control group's intervention was not detailed but based off the article it seems that they merely got group counselling (Wang, Wang, & Zhang, 2013).

The results of the study are in line with the prior studies mentioned, being that music therapy was a help for college students. The measurements were taken before and after the intervention. Scores pre-test weren't significantly different, but post-test scores told a different

story. The post-test scores of the experimental group reduced significantly, however, the control group's scores did not reduce as such. The study's combination of music listening, music appreciation, and activities were this study's strongest assets and definitely contributed to the results (Wang, Wang, & Zhang, 2013).

An older study conducted in 1989 by Julia H. Haines found a more unique result when researching music therapy's effects on depression. Her study had 19 participants aged 11 to 16 years old and she divided them into two groups. The music therapy group got 3 weeks of music therapy with 2 half-hour sessions per week and consisted of things like call-and response exercises, songwriting, listening activities, improvisations, singing and rhythm activities. The verbal therapy group met just as frequently and their sessions consisted of sharing autobiographical information, storytelling, engaging in association word games, positive support techniques, and story writing. After each group completed their sessions, they were then switched and went through the other therapy session (Haines, 1989).

The results showed no statistically significant difference in the pre-test scores and post-test scores or between the two groups, and the measurements were a pre-test ten question observation sheet created by the researchers and a post-test Coopersmith Self-Esteem Inventory test. Any difference between the two groups was so minimal it was considered random by the researchers. What was incredibly evident was the difference in opinions of the participants on their respective groups. The music therapy group had no complaints about being placed into the group, while everyone except 1 one person in the verbal therapy group didn't enjoy the experience. The music therapy group's members also participated earlier in the trial as well as more often. The children even noted that the environments were different; the music therapy

group had a fairly interactive environment while the verbal therapy group's environment lead to more fight or flight interactions (Haines, 1989).

## **Anxiety**

Music therapy has been researched extensively as a potential treatment method for anxiety as well. Anxiety and depression quite often go hand in hand, and sometimes one can even cause the other, so it's no wonder that anxiety was thought to be treated with music therapy as it works for depression. And just like depression, anxiety can have many root causes and is often situational. Anxiety is something that all humans experience; it's natural to be fearful of some future event. Anxiety disorder is different, however, as the anxiety from an anxiety disorder is excessive, persistent for periods of 6 months or more, and occurs during periods in which it shouldn't. Anxiety from one disorder to the next isn't extremely different; the difference is there but not in the anxiety felt. The major difference lies in the trigger of the anxiety (American Psychiatric Association, 2013).

Separation anxiety is anxiety that's triggered by the separation (or anticipated separation) of someone or something held close to the afflicted and the afflicted person. A person afflicted with separation anxiety will fear the worst happening to something or someone they're about to part with and do so consistently. This fear can lead to a desire to stay home and inside more often as to not be separated from the person or object they're attached to. Specific phobia is an intense fear or anxiety about an object or situation (fear of flying, heights, and more fall under this category of anxiety). The presence of this object or situation typically causes an immediate spike

in anxiety and/or fear levels and can cause the afflicted person to avoid it entirely (American Psychiatric Association, 2013).

Anxiety doesn't have to be so specific, however, as it can be quite general and far-reaching. Generalized anxiety disorder is anxiety about a vast array of things, so vast in fact it could only be categorized as "general" in the naming of the disorder. For example, someone with generalized anxiety disorder could be nervous about going to the same workplace they've been employed at for months, or consistently worried about seeing a spouse with whom they're quite comfortable. This worry is incredibly difficult to control, and can cause: restlessness or feeling keyed up or on edge, becoming easily fatigued, some difficulty concentrating, irritability, muscle tension, or even difficulty with sleep. Many more types of anxiety exist and some come with their own unique symptoms, such as the lack of speech in specific scenarios with selective mutism (American Psychiatric Association, 2013).

There is no cure for any anxiety disorder but many treatment options exist for both lowering the amount of anxiety as well as gaining control over the thoughts themselves. Cannabidiol (CBD) is a treatment method that has been gaining momentum over recent years. Cannabidiol is a constituent of Cannabis sativa and lacks any of the psychoactive effects found in  $\Delta^9$ -tetrahydrocannabinol, otherwise known as THC. CBD is known for having anxiolytic effects while simultaneously having minimal sedative effects as well as a great safety profile (Blessing, Steenkamp, Manzares, & Marmar, 2015). Another popular method of treatment is the aforementioned CBT and it's arguably the most popular treatment method for anxiety right now (Hoffman and Otto, 2017).

Cancer patients often feel anxiety because their situation is volatile and sometimes treatment is something not looked forward to. A study by Joke Bradt, Noah Potvin & Amy Kesslick, Minjung Shim, Donna Radl, Emily Schriver, Edward J. Gracely and Lydia T. Komarnicky-Kocher looked to see how music therapy helped with various symptoms felt by cancer patients, including anxiety. They compared it to music medicine, which again is simply listening to music to try and achieve therapeutic effects (Bradt et al., 2014).

The study had 31 participants who had to do both music therapy and partake in the use of music medicine, but the order in which they did so was randomized. There were 2 sessions of music therapy, each thirty to forty-five minutes long and occurred in the same week. Each session was done in a one-on-one fashion and began with the patient discussing current concerns. The music therapist then offered live music based off what they heard and invited patients to join in by singing or playing an instrument. The rest of the session included things such as songwriting, breathing exercises, and vocal improvisation. The music medicine sessions were just as long and as frequent, and merely consisted of listening to a playlist that was created for each patient based off their preferences through an iPod. A pre and post test was conducted for each type of therapy on a scale they created to measure mood, anxiety, and relaxation (Bradt et al., 2014).

The quantitative results of the study do not support the efficacy of music therapy. The problem isn't that music therapy didn't help; in fact it was shown to have beneficial effects on pain, anxiety, mood, and levels of relaxation. The issue is that these results are the same in the music medicine group, showing that all the extra effort put into the music therapy sessions had an equal effect to people merely listening to an iPod. The qualitative results gathered from an

exit interview conducted after each session give more insight to just how exactly music therapy helped the patients in the study (Bradt et al., 2014).

The first major point is that patients directly stated that they personally thought music therapy helped with symptoms. Patients talked about how music was a temporary escape from the present and enabled them to feel relaxed and peaceful. Many patients even went as far as to say it took them back in time as they felt like a kid again because they felt as if the music therapy sessions were playful and fun. This childhood-factor is also present in the second major point, which is that music elicited many memories from childhood and life in general prior to illness. Some outliers felt feelings of trauma from the music and that is definitely worth noting. The third major point is looking at the future instead of the past. Music gave patients hope for the future. It is interesting to note in comparison to the prior two points is that music simultaneously made people look both into the past and the future (Bradt et al., 2014).

The fourth major point patients made was that they appreciated having a therapist be in the room for multiple reasons. Firstly, in the music medicine trials the iPod was the therapist so to speak, but patients preferred a human because they could connect more. Secondly, the human therapist was able to offer empathetic support and feelings of care that the iPod simply could not. Finally, the therapist's act of making music with the patient was heavily enjoyed and preferred. The final major point that patients touched on in the interviews was that the music therapy in particular helped with emotions on two fronts. Firstly, it helped release emotions that might typically be suppressed or even repressed. Secondly, these emotions were able to be verbally processed with the therapist, and that was very much helpful according to the patients (Bradt et al., 2014).

This study concluded that both music therapy and music medicine are useful treatment methods for anxiety (amongst other things they tested). Music medicine and music therapy both enhance symptom management, but the presence of a therapist in music therapy adds for a deeper psychological support that can really help the patient when on their own. Even though both methods work, music therapy was widely preferred over music medicine due to the presence of a therapist and the interactivity of the session (Bradt et al., 2014).

Receiving ventilatory service is another medical circumstance that can cause anxiety as it's a very invasive and long-lasting circumstance. An older study conducted by Linda Chlan in 1998 sought to treat the anxiety and low relaxation levels of patients receiving ventilatory assistance with music therapy. Their study had 54 participants and allowed participants to be included if they were ventilator-dependant, alert, mentally competent, had adequate hearing, and spoke English as the primary language. The only way to be excluded was if the applicant was receiving continuous intravenous sedation (Chlan, 1998)

The participants were broken up into two groups. The experimental group received music therapy. The sessions began with patients selecting a tape from the therapist's collection. All the tapes had non-lyrical music that was considered to be relaxing, and contained music across multiple genres. The patient was instructed to listen to the tape for thirty minutes with their eyes closed and to listen to the flow of the music. The second group, the control group, merely had a resting period of equal length. Both groups sat in a room that was designed to enhance relaxation: lights were dimmed, blinds were closed, and there was a "Do Not Disturb" sign hung outside the door (Chlan, 1998).

The results were calculated by conducting a pre-test-post-test analysis. Chlan used heart rate and respiratory rate as a measure of anxiety. The control group did see change in both measures, but they were positive and negative changes. The experimental group saw change in both measures as well, however, they were all positive changes. What's interesting is the lowering of the heart rate was due to the heart rate actually synchronizing with the tempo of the music, which is most likely why this passive approach to music therapy was chosen (Chlan, 1998).

This study is promising but has one major flaw: the interventions. This study claims to apply music therapy in order to reduce anxiety, but did they? One could argue they used the aforementioned music medicine, as the session they attended wasn't very guided. On the other hand, a therapist was present and responsible for the pool of music choices, which were specifically selected due to their relaxing/therapeutic nature. Whether music therapy or music medicine was employed is unclear, but what is clear is that music did reduce the symptoms the investigators associated with anxiety (Chlan, 1998). These results are promising because if the interventions are more interactive then maybe even greater help can be delivered.

Adults aren't the only people susceptible to medical-related anxiety. Children get anxious about medicine and procedures and other related things just as adults do. Preoperative anxiety can be quite high in children, and some parents may be reluctant to put their four-year-old on anti-anxiety pills. Zeev N. Kain, Alison A. Caldwell-Andrews, Dawn M. Krivutza, Megan E. Weinberg, MA, Dorothy Gaal, Shu-Ming Wang, and Linda C. Mayes aimed to see if music therapy was an effective anti-anxiety measure for children as well as something that made them

more compliant during the induction of anesthesia when compared to nothing as well as when compared to a drug (2004).

The study had 123 participants, all of whom were three to seven years of age. Patients were not allowed to participate if they had any history of chronic illness, prematurity, developmental delay, or significant hearing/vision loss. The participants were divided into 3 groups. One of the experimental groups, the music therapy group, met before the operation and had a music therapy session. The session started with the therapist telling the child they are aware of the surgery and they're going to work with the child to make the day better. In the next part of the session the child and therapist played music together in a way that allowed the child's anxiety to be discussed and released. The children were encouraged to be in control through their allowance of instrument choice, and ability to set the tone and pace of the session. Following the session, the therapist took the child to the operating room while discussing and reflecting upon coping mechanisms for the anxiety. The other experimental group merely received oral midazolam 0.5 mg/kg a half hour prior to the surgery up to 20 mg. The control group received neither and carried about their pre-operation normally (Kain et al., 2004).

Unfortunately, the results were not promising for music therapy. The investigators measured children's preoperative anxiety on the mYPAS, the compliance of the child undergoing anesthesia on the Induction Compliance Checklist, temperament on the EASI (emotionality, activity, sociability, and impulsivity) scale, and allowed children to self report their anxiety by using the State-Trait Anxiety Inventory. Baseline measurements as well as measurements taken upon separation from parent and therapist showed that music therapy was as effective at treating the anxiety as doing nothing was; in other words, the control group and the music therapy group

showed congruent results. The midazolam group saw the most success and experienced the largest reduction in anxiety (Kain et al., 2004).

All though the results were not promising for music therapy, they did unveil something interesting. They revealed that music therapy is very much subjected to the therapist effect. The therapist effect basically states that therapists can affect their patients in more ways than just one. The personality of the therapist and more all play into the effects of the session, just like how a teacher's personality, separate of their actual teaching skills, can affect how much one learns. The study employed 2 therapists and kids who saw therapist 2 saw greater reductions in anxiety than the ones who saw therapist 1, even though both employed identical music therapy techniques (Kain et al., 2004). This study is useful because it emphasizes that the therapist is an important part of the mental health equation along with the therapy they provide.

Fear of death is a fear many experience, and being diagnosed as terminally ill can amplify that fear, or create it if it wasn't present prior. A study conducted by Horne-Thompson and Grocke aimed to see if music therapy could be effective in reducing the anxiety felt by some terminally ill patients. Their study had 25 participants who ranged from 18 to 90 years of age. These participants were randomly divided into two groups. The experimental group received one music therapy session that was anywhere from 20 to 40 minutes in length. The sessions varied from one patient to the next as they were tailored to the specific patient. The therapist decided if the session would be active or passive, and included activities such as playing live familiar music, singing, music and imagery, and listening to recorded music. The control group also had one session and instead was led by a volunteer. The investigators argue in the article that control groups that do nothing are ineffective for trials like this, so this control group did receive some

care. The volunteer running their sessions did things such as read and play with the patient, but had to steer clear of music entirely (Kain et al., 2004).

Results were gathered by conducting pre-test-post-test methods. The test taken was the ESAS, which is a self-report test that is specifically designed for assessing patients in palliative care. A pulse oximeter was also used to track pulse. The results from the ESAS did show that patients felt a significant reduction in pain, tiredness, drowsiness, but most importantly: anxiety. The pulse oximeter showed that contrastingly heart rate was not reduced in the experimental group. This may not be a bad thing though because patients reported being more energetic, which would coincide with an increased heart rate (Kain et al., 2004).

Anxiety isn't always about something specific like a medical situation; as mentioned earlier, anxiety can be generalized and apply to a wide array of scenarios. Generalized anxiety disorder is exactly what Gutierrez and Camarena desired to treat with music therapy. They ran a small study with seven participants aged 25 to forty-five years old and all of these participants were placed into the same group. No control group was present and thus the music therapy group was the only one in the study (2015).

The experimental group met once a week for 12 weeks as a group. Those 12 sessions were 2 hours long and heavily-structured. The entire music therapy process across the 12 weeks was broken down into 7 steps. The first step was identification of the theme, which in other words simply means they identified the problem and the plan of attack. The second step was the preparation step, in which patients were emotionally and physically prepared to enter the therapeutic experience. The third step was the exploration steps in which patients explore, identify, and report experiences they've had that gave them anxiety. The fourth step is contact,

and the patient begins to connect with their memories in this step. The fifth step is the intensification step in which patients intensify how they recall memories and express emotions. The sixth step is resolution, and in this step the patient concludes connecting with the memories and prepares for the final therapeutic experience. The seventh and final step, processing, involves the patient reflecting upon the experience and connecting it to their life. Each of the 12 sessions focused on one or multiple of these steps (Gutierrez and Camarena, 2015).

To measure change in anxiety the investigators employed the Beck Anxiety Inventory as a pre-test and post-test. The results showed that music therapy was highly effective in reducing symptoms present in persons afflicted with Generalized anxiety disorder. Active music therapy was used for physical distress while passive music therapy was used more for emotional distress, and the careful combination of both showed itself to be quite effective (Gutierrez and Camarena, 2015). Depression was also tested as generalized anxiety disorder and depression are commonly diagnosed together (Hoge et al., 2004). Depression was also shown to be lowered, and some patients even claimed to be completely rid of it (Gutierrez and Camarena, 2015).

## **Autism**

As we've now seen, music therapy can have a positive effects on multiple symptoms of anxiety and depression. While those disorders of course differ in multiple ways, as previously-stated they often are diagnosed together and one can even lead to the appearance of the other. Autism Spectrum Disorder differs in even more ways than anxiety and depression do from each other, and yet music therapy was shown to also be an effective method of treatment for the disorder.

Autism Spectrum Disorder, otherwise known as Autism or ASD, is a mental disorder that manifests socially. Autism affects social communication and social interaction across multiple contexts. Social reciprocity, nonverbal communicative behaviors intended for social situations, and relationship skills are all aspects of social communication and interaction that become hindered under autism. Autism also brings about restricted, repetitive patterns of behavior, interests, or activities (American Psychiatric Association, 2013). These symptoms change over time and thus may require looking into someone's past to accurately diagnose the.

The DSM-5 outlines the aforementioned diagnostic criteria for autism more in depth. As previously mentioned, autism has persistent negative effects on social communication and interaction across multiple contexts. The DSM names three contexts in particular that are indicative of autism if executed poorly. One context is social-emotional reciprocity. Deficits in this area manifest as an inability or difficulty in reciprocating emotion in conversation as well as initiating discussion or eye contact. The second deficit is in communicative behaviors used for social situations and interaction, but specifically nonverbal behavior. These deficits manifest in multiple ways. People with autism have difficulty interpreting body language; subtle cues like eye contact, arm folding, and more common body language motions may not be picked up or interpreted properly. Not only that, but sending out these signals may also be done incorrectly or even not at all.

The final deficit revolves around relationships. More specifically, the deficit is in the ability to form, maintain, and understand relationships, which can manifest as having difficulty playing with others or changing behavior so it makes a relationship or group more cohesive. Patterns of behavior are also restricted and often repetitive. For example, someone diagnosed

with autism may only be interested in one or two things at a time, and these interests become fixated upon (American Psychiatric Association, 2013). My younger brother who has autism is fixated on basketball; he doesn't show interest in a lot, but if you talk to him about basketball he can do it for hours on end.

There currently is no cure for autism, and the only medicine available that's approved by the FDA is Risperidone, which only helps with irritability. Treatments for autism are therapeutic, ranging from discrete trial training, to pivotal response training, early intensive behavioral intervention, and verbal behavior intervention (What Are the Treatments for Autism?, n.d.). One new and emerging way of treating autism, however, is music therapy. It overall has been shown to be effective, with each study carrying few limitations.

One study conducted by Marianna Boso, M.D., Enzo Emanuele, M.D., Vera Minazzi, D.Mus., Marta Abbamonte, M.D., and Pierluigi Politi, M.D., Ph.D aimed to see whether or not interactive music therapy could enhance the behavior profiles and musical skills of young adults who have been diagnosed with severe autism. The participants of their study consisted of eight adults, seven of which were male and one of which was female, and were aged between 23 and 38 years old. All of these participants were completely and wholly inexperienced with musical therapy. The study lasted 52 weeks and consisted of group sessions. Each intervention occurred once a week, and consisted of different activities. Three activities were done in succession at each session, for example one session had the group playing piano then drumming and then singing. Each of these sessions centered around live music-making experiences, and they were intended to improve social engagement, behavioral problems, and enhance creative music making (Boso et al., 2007).

The results of this study were quite interesting, and promising as well. Significant improvements were shown in both autistic behaviors as well as music skills. Music skills, such as singing a short or long melody, playing the C scale on a keyboard, music absorption, rhythm reproduction, and execution of complex rhythmic patterns, were significantly improved when you look at the scores of each at baseline versus after 52 weeks. The scores on the CGI and BPRS scales they used to measure symptom severity also improved from baseline to 52 weeks. What makes these results interesting is that both musical skill and ASD metric scores improved significantly from week 0 to 26, but insignificantly from week 26 to 52. This indicated that additional interventions may be necessary beyond the initial 6 month period (Boso et al., 2007).

Mössler et al. conducted a study aiming to see if children with autism could be better treated if the music therapy given to them was adapted and attuned to them. This study completed these goals with 48 participants. These participants hailed from 7 countries, were aged 4-7 years old, and were 81% male. Participants would be excluded if they had sensory disorders that were serious such as blindness or deafness, or if they had more than negligible experience with music therapy. This study had no control group, but rather compared high intensity and low intensity weekly sessions of music therapy, in which the high intensity group attended three thirty-minute sessions a week, while the low intensity group attended one thirty minute session a week. These sessions were weekly over the course of 5 months, and the music therapy conducted during each session was improvisational and uniquely tuned to the individual child in each session (Mössler et. al, 2017).

The findings of this study overlap in certain ways with the first one mentioned. The most important way they overlap is they show the importance of a customized experience to the child.

The aims of this study weren't merely to test whether music therapy helps treat symptoms of autism, but the goal was also to see whether the therapist-patient relationship had an effect on the outcome. One of the criteria for the music therapy conducted was that it was to be attuned to the child's emotional state. Typically the music played in an active music therapy is planned out to some degree beforehand; maybe the therapist simply knows he wants slow music to be played. This music therapy session was different because the therapist was acting to be more reactive than proactive when making music. They were always to take the child's emotional state into consideration before making any music (Mössler et. al, 2017).

The first study claimed that additional interventions may be necessary, and this study showed why; the results of this study show that the relationship between therapist and patient is important and is a predictor of the effectiveness of music therapy. The results showed that the children's symptoms improved on the tests given before, halfway through, and after the trial. This success is believed to be due to the relationship and bond formed by creating music with the child instead of for them (Mössler et. al, 2017). The first study did not establish a good enough relationship between patient and therapist. How could a good individual therapeutic relationship between two people form if the therapist is trying to do this simultaneously with multiple people in a group? If the findings of this study are to be believed then that could explain the plateauing effects of the former study. The fact that this study was done in an individual setting compared to a group one may be the reason why the relationship was formed very strongly.

A third example of a study looking at music therapy's effects on autism is one conducted by Jinah Kim, Tony Wigram, and Christian Gold. This study looked at music therapy in comparison with therapy centered around playing with toys. The participants were aged three to

five years old, had no experience in either therapy, and were all male. The study's duration was 12 consecutive weeks, and during those weeks the children were subjected to thirty minute sessions, regardless of whether they were in the toy group or the music therapy group. Every child was subjected to both therapies, but the order in which they would receive the therapy was randomized; some kids did toy therapy for twelve weeks while the other kids did music therapy, then after the twelve weeks and a one week washout period they switched. This study looked to see the duration and frequency of certain behaviors. Joy and emotional synchronicity between child and therapist were analysed in terms of frequency and duration of occurrences. Initiation of engagement, compliant response, and no response were behaviors measured purely by frequency (Kim, Wigram, & Gold, 2009).

The results show that children doing music therapy improved or did well in many categories. For starters, they improved in their ability to show initiation; they started more music and more talking with the therapists over time as compared to the toy play sessions. The most important finding is that music therapy showed vast improvements in joy and emotional synchronicity as well. To be more specific, when children were leading the sessions they showed more signs of being happy as well as being emotionally synchronized with the therapist (Kim, Wigram, & Gold, 2009). Children with autism initiating things is quite rare, and the ability to initiate and take charge is an important trait to have, so this discovery is quite important.

## **Dementia**

Dementia is a disorder that even further diversifies the list of successes music therapy has. Anxiety, depression, and ASD do differ but also have their similarities; all three can manifest

negatively in social situations for example. But unlike all three of the previously-touched upon disorders, dementia's symptoms are deteriorative and affect different brain functions. Dementia is a classification of major neurocognitive disorders and is one that affects many millions of people worldwide with almost ten million new cases per year. The onset of dementia is gradual and thus hard to notice, and because of this the earliest stage of dementia is not always noticed. Symptoms such as forgetfulness, losing track of time, and even becoming lost in familiar places are all signs of the onset of dementia. The middle stage's symptoms are more striking and don't go unnoticed as often or easily. Becoming lost at home, having sudden difficulty communicating, experiencing behavior changes such as wandering, and forgetfulness are all symptoms of dementia's escalation in an individual. The final stage of dementia leaves the afflicted in a state of severe dependency and inactivity as well. Symptoms such as more-extreme forgetfulness (forgetting friends and family more regularly), difficulty walking, lack of awareness regarding time and place, and escalated levels of aggression are all symptoms of dementia's final stage ("Dementia", n.d.).

Dementia comes in many forms and all though the symptoms/signs above can indicate dementia, more information is needed to determine specifically what dementia a patient has and where it came from. Dementia can be due to: Alzheimer's disease, frontotemporal lobar degeneration, lewy body disease, HIV infection, vascular disease, traumatic brain injury, substance/medication use, prion disease, Parkinson's disease, Huntington's disease, and other harder-to-specify origins. No matter the origin, dementia causes a significant decline from prior cognitive domain performance in one or more of the following cognitive domains: complex

attention, executive function, learning and memory, language, perceptual-motor, and social cognition (American Psychiatric Association, 2013).

Treatments do exist for dementia, all though there is no cure. The treatments themselves don't slow regression at all, they merely aid with symptoms for a short while. Memory loss is a common symptom of dementia, especially in patients with Alzheimer's disease, which account for 60% to 80% of dementia cases ("What Is Dementia?", n.d.). Medications have been created to treat the cognitive symptoms of dementia, but only 2 types have been FDA approved.

Cholinesterase inhibitors are the first type and some brands of it are Aricept, Exelon, and Razadyne. Memantine is the other type and the only drug approved under that name thus far has been Namenda. These drugs don't slow down the progression of dementia, but it aids with memory loss and confusion (Medications For Memory, n.d.).

Behavioral symptoms in dementia, such as agitation, depression, and anxiety can be difficult to cope with and treat. Nonmedical treatment is mainly comfort-based; treating the patient with respect, patience, and understanding really is the gist of it. Treatment consists of quality-of-life actions for the patient such as: making sure they're well-fed, making sure they're not thirsty, providing a security object, and allowing adequate rest in between stimulating activities and events. Medicinal approaches to treatment consist of the antidepressants and anxiolytics mentioned in the depression section. Antipsychotics such as Abilify and Clozaril are used to help with hallucinations, aggression, agitation, and uncooperativeness (Treatments For Behavior, n.d.)

Music therapy has been used to treat symptoms of dementia, notably the behavioral ones. The anxiety and depression from dementia arise for reasons different than the ones mentioned in

the depression section yet the same medications help, and music therapy is no different (Guetin, Portet, Picot, & Pommie, 2009; Ray and Mittelman, 2017). Music therapy is also being tested as a way of treating the agitation symptoms in peoples with dementia as it's one of the symptoms that causes the greatest distress in their caretakers.

A study conducted by Ridder, Stige, Qvale, and Gold aimed to see just how effective individual music therapy could be in treating the agitation felt by patients with dementia. Their crossover trial consisted of 42 patients ranging from 66 to 96 years of age. Participants could only participate if they had moderate to severe dementia, a referral to music therapy, and symptoms of agitation (2013).

The 42 patients were split up into two groups. The music therapy group received interventions twice a week for six weeks. These sessions were intended to get the attention of the patient while creating a safe environment, regulating arousal so that self-regulation is possible, and to create communication that fills psychosocial needs. After each session, the therapist noted the frequency of the usage of each of these techniques on a scale of 1 to 4: improvising, singing, listening, dancing/moving, and other (walking, talking, etc.). The control group just received treatment as usual, which could include anything involving music such as group singing as long as it wasn't music therapy. This lasted for six weeks as well. After each group's 6-week trial period, they switched groups (Ridder, Stige, Qvale, & Gold, 2013).

Agitation was the primary outcome measure in this trial and was measured in weeks zero, seven, and fourteen by using the CMAI-fr nursing home form (Cohen-Mansfield et al., 1989) as well as the CMAI-di (Cohen-Mansfield et al., 1991). The former measures the frequency of activities such as hoarding, hitting, and pacing to name a few of the 29 measures. These get

measured on a scale of one to seven. Meanwhile, the latter measures the disruptiveness of each of these twenty-nine symptoms and measures them on a scale of one to five. After measuring all these factors and analyzing changes over time, the investigators concluded that the six weeks of music therapy severely reduced agitation in patients with dementia (Ridder, Stige, Qvale, & Gold, 2013).

The scores on the CMAI-dr for agitation were lowered significantly, showing that patients reported their agitation being less disruptive as time passed. The frequency was measured as well, and while it did show decreases they weren't statistically significant as the effect size was small. Another interesting find was that patients did not increase any medication while in the music therapy group, however, seven patients increased dosage whilst in the control group (Ridder, Stige, Qvale, & Gold, 2013).

Another study conducted by Cheong et al. sought to use creative music therapy to improve pleasure and engagement in patients in an acute care setting with dementia. The study consisted of 25 participants and took place over three months. Participants could only be included if they: were 65 years of age or older, had a diagnosis of dementia, had no prior experience to creative music therapy, had no severe hearing impairment without a hearing aid present, were not suffering from behavior that prohibited participation, and were not medically unstable. While the experiment took place over three months, the trial for each patient took place over three days (2016).

During these three days each patient was subjected to both control and experimental conditions. On the first day, the patients underwent individual treatment as usual for 90 minutes. This treatment as usual consisted of things such as personal care, hygiene, vital sign testing, and

therapy. On days two and three, patients were mapped on the Lawton Observed Emotion Rating Scale (OERS) which measured: pleasure, general alertness, anger, anxiety/fear, and sadness. The sessions on days two and three were ninety minutes in length as well, but the CMT was placed in the middle of that block for thirty minutes. In other words, the patients had thirty minutes of treatment as usual both before and after the thirty minute CMT session (Cheong et al., 2016).

The results showed that agitation was decreased significantly more during the CMT session in comparison to the regular-treatment sessions pre and post CMT; pleasure and alertness scores were highest during CMT while anger and anxiety scores were at their lowest. These findings are important because most studies look at music therapy's effect in the long term, but neglect to test with short-term in mind. Patients with dementia may only be in the hospital for a short period of time and thus they'd need something that works quickly. Medications and such may work but take time to do so, but as shown here music therapy is a great short term alternative if one is required (Cheong et al., 2016).

## **Results & Discussion**

### **Efficacy**

Music therapy was shown to be an effective mode of treatment across multiple disorders. Studies of many varying methodologies from all parts of the world have been conducted to test the effectiveness of music therapy as well as the feasibility of investigating it further. Music therapy is usually tested against a control group; in most cases this was a group that received “treatment as usual”. When comparing the two, music therapy wasn't always more effective than treatment as usual. On the other hand what is important to note is that not a single study read, out of all the ones included in this paper as well as the ones that were omitted, concluded that music therapy was less effective than treatment as usual.

These data shows that music therapy can sometimes demonstrate the efficacy of or the more “conventional” treatments deployed as control conditions (e.g., antidepressants, therapy). This begs the question that many of the authors above ask: "why isn't music therapy recommended by doctors, or even heard of in some cases, if it is shown to work so well with very minimal distress to patients?". Most studies didn't report how the music therapy affected the patient in terms of causing any distress or stress, however, the few that did expressed how small the distress was if it was even present at all (which was rare). In fact, even when music therapy wasn't shown to be more effective than other methods of treatment, patients expressed their overwhelming preference for the process of music therapy as they found it to be enjoyable and relaxing (Haines, 1989).

What is also important to mention is that every single study that studied music therapy in conjunction with treatment as usual concluded that the combination was more effective than just usual treatment. This is yet another observation that is a puzzling one. The overwhelming data in favor of music therapy would make one believe the practice is known well, but this is simply not the case. The practical implications of this discovery are simple: music therapy is an effective treatment of many types of symptoms when used on its own but especially in conjunction with treatment as usual.

Why is music therapy so effective? That question is one that some of the researchers attempted to answer but even they admitted the phenomenon is so complex their hypotheses are to be taken with a grain of salt. Through reading these hypotheses as well as noticing common themes across studies, a few things were made apparent. Firstly, one reason music therapy is effective is its liquid form. Music therapy is not rigid nor is there one way of practicing it; in the US alone, the most recent numbers show there are over 14 schools and 100 techniques of music therapy (Wigram, Pedersen, & Bonde, 2003). It's safe to assume those numbers have grown over the past decade and a half as well. These techniques are not executed identically each time as the approach for tackling the problems of one patient to the next, meaning 2 patients seeing the same music therapist for anxiety may be subject to the same school and similar techniques but their sessions will not be identical.

Adding to the versatility of music therapy is the individual versus group approach. Depending on the situation of a patient they may partake in a music therapy program that's one-on-one which creates a sense of privacy and comfort in some cases. Some people may benefit from doing music therapy in a group setting though, and that is absolutely a possibility

and has shown to be quite effective when it's the right choice over individual music therapy. For example, disorders that create antisocial symptoms are best treated with group therapy because it creates a social experience and overtime it improves social skills.

Another common denominator across studies that explains music therapy's effectiveness is that it offers a temporary escape or distraction. Passive music therapy elicited these feelings but active music therapy did so more often. Active music therapy involves playing music, singing, and more participation in general when compared to a passive music therapy session. This extra involvement forces the brain to stay in the moment, or focus on past moments, without being enveloped in the symptoms they came in looking to treat. Passive music therapy might help create the distraction if the patient is capable of really getting into the music, but someone with anxiety for example may find that difficult because of their racing and intrusive thoughts.

The reason behind music therapy's efficacy is hard to discover because it's so complex, but I hypothesize that its complexity is actually a large reason for its efficacy. Music therapy, and music in general, activates many areas of the brain at the same time. When listening to music during a session of passive music therapy, the brain is processing sound, language, tempo, pitch, and more simultaneously in conjunction with any emotions being felt or thoughts being thought. Active music therapy sessions are even more stimulating because in addition to everything just mentioned, the brain must actively command muscles to produce music reflective of emotion. The intermingling of all these factors is something I believe is very important to understand just why music therapy works for such a wide array of disorders.

## **Additional Disorders**

These findings are important for multiple reasons. Firstly, they show that music used therapeutically alleviates many symptoms across many disorders, even when medications and other modes of treatment don't work as well. They are also important because they call for research to be done on more disorders than the ones discussed thus far, and some of that research has begun.

Other disorders and symptoms have been researched through a music therapy lens, but the amount of literature for these is not vast. One example of this is insomnia and other sleep issues. Not much literature exists on the matter, but what is out there is promising. One study conducted by Sarikaya and Oguz looked to see how music therapy affected the sleep quality of nursing home residents who were having difficulty sleeping. Their study consisted of 34 participants who received music therapy daily for 3 weeks. The music therapy was done in a group format and was passive. Questionnaires were given to assess sleep quality both before the test and after the 3 weeks concluded and the results shows that quality and duration of sleep did in fact improve with the use of music therapy (Sarikaya and Oguz, 2016).

Another study conducted by Chan, Chan, and Mok also sought to see if music therapy would aid sleep. They chose to use passive music therapy as well, which would make sense because actively playing music and such would stimulate the brain and body, making the whole process counterproductive. The experiment managed to recruit 42 participants who were all senior citizens and then split them into two groups. The experimental group received very controlled passive music therapy once a week for 4 weeks, with each session being thirty minutes long. The control group just received treatment as usual throughout the duration of the

trial. The experimenters kept track of blood pressure, heart rate, depression, and sleep quality weekly and used these as the main outcome measures. The results showed a statistically significant increase in sleep quality and decrease in depression after week 4 for the experimental group, whereas the control group did not show the same change (Chan, Chan, & Mok, 2010)

Schizophrenia has slowly begun to take hold as something worth studying through the lens of music therapy, but that hold is definitely coming slowly as there is not very much literature at all on the topic, but it does exist. One example of this literature is a study conducted by Lu et al. sought to see if group music therapy could help depressive and psychiatric symptoms of schizophrenia. The decision to use group therapy makes sense figuring depression, a disorder with negative social symptoms, is one of the things the researchers are attempting to improve. This study consisted of 80 participants and lasted five weeks (Lu et al., 2013).

The patients were split into two groups: the experimental group and the control group. The experimental group received 2 hour-long sessions of music therapy a week and also received treatment as usual. The control group solely received treatment as usual. Tests were done to measure the outcome measures at baseline, post-test, and one final time for a 3-month follow up. Analyzing the data collected from these tests, the researchers concluded that music therapy was quite effective in alleviating both symptomologies: depressive and psychiatric (Lu et al., 2013).

Another study conducted by Talwar et al. aimed to find if music therapy could assist with psychiatric symptoms of schizophrenia. Their study consisted of 81 participants (a rather large number which is good) and split them into two groups. The experimental group received music therapy in conjunction with treatment as usual for 12 weeks, with sessions occurring once a week for up to forty-five minutes. These sessions were individual unlike the last study's method.

Measurements of psychiatric symptoms were taken at baseline and post-test. Upon analyzing the changes in the data, the investigators concluded once again that music therapy effectively treated the psychiatric symptoms being experienced by the patients (Talwar et al., 2006).

As we now see, even clearer than earlier, the scope of possibilities for music therapy is vast; symptomologies of many kinds and origins can be effectively treated with music therapy. Unfortunately, while all the findings discussed convey the efficacy of music therapy, the studies that brought about these findings were littered with limitations and shortcomings. The biggest, most glaring limitation: the generalizability of the results. An overwhelmingly large number of studies showed music therapy to be effective, but a majority that's even larger is the number of studies that didn't adequately diversify their pool of participants. A lot of factors such as ethnicity, race, age, sex, heritage, living situation, and more were more oft than not either taken into account but never affected the methodology or just ignored. Not only that, but the amount of people in these pools were often times incredibly low; one study even had a number as low as seven participants (Kim, Wigram, & Gold, 2008). Any results found from studies this small and/or with such a lack of diversity can arguably be said to be just applying to the participants in the study, rather than it having the implications of it applying to a bigger population. Collectively for each disorder, however, all the studies cover a wide variety of factors which make the collective results diverse,

### **Limitations**

The collective results may be misleading, as another limitation is the scales and measurements used. The scales and measurements are not inherently a problem, in fact they tended to be quite detailed and offered a lot of insightful information. The problem is that, for

example, every depression study didn't use the same MADR scale. If each one used the same scale, then we could guarantee that results all are applicable as they follow the same criteria. However, since scales between studies are different, who's to say that one study, if conducted congruently to the first one with the same variables down to the atoms of the Earth, would have the same results they did initially if they used a different scale to gather results? In other words one study might conclude that music therapy works well, but if they used a different scale maybe the conclusion could be different.

Another limitation is that not all music therapy studies were actually using music therapy. A lot of studies claim to have used music therapy to treat a disorder, but in the study only music medicine was used. The mistake is easy to make; passive music therapy is quite close to music medicine. However, music medicine is not guided nor set up by a trained therapist; anyone listening to Spotify before bed to sleep better is using music therapy. The results acquired from these are useful for the research of music therapy, but as previously stated music medicine does not equal music therapy.

The final big limitation is that most studies did not test music therapy's effects after the therapy itself ceased. Music therapy is quite a complex phenomenon so studying every aspect we can is paramount in decoding and perfecting it. Erkkila et al.'s study is one of a few that decided to test this aspect and did so for up to six months after the study had concluded (2016). If more studies followed suit and decided to take follow up measurements, music therapy may be shown to be even more effective as it might have lingering positive effects.

The overwhelming success of music therapy studies coupled with the undeniable limitations of these studies demonstrate that research in music therapy is still young and leaves a

lot to be discovered and tested. For starters, more disorders need to be researched. Music therapy has been shown to be too useful to not be studied as a treatment for as many disorders as possible. These studies should have large, diverse pools of participants so that what they find can be generalized to a greater population. Another direction that research can go in the future is that it can test music therapy versus music medicine more often. Maybe some disorders can be treated as effectively at home with an iPod as with a professional music therapist. Finding this information out could save people a lot of money, headaches, and provide happiness and relief they've been searching for.

### **Wrap Up**

To recap, music has been used for centuries for a wide variety of pro-health purposes. As we've seen, it has been used to magically give energy to Olympians, attune oneself with the vibrations of the universe, and more. Nowadays the notion that music can have healing properties has re-emerged with a new driving force behind it: science. Music has been thought to have healing properties for a while, but now that belief is being put to the test, the scientific test. It's not quite being used to give magical energy to athletes anymore, however, it is being used to deliver some wonderful benefits. These benefits vary in both the benefit itself, how it is achieved, and what disorder or ailment it is used to treat.

Music therapy was used across a wide variety of symptoms as a treatment, but it is not a cure by any means nor did any study show it to be or claim it to be. Symptoms observed in this literature review ranged from social, to physical, to attentional, and more. Music therapy was able to treat the symptoms mentioned throughout this paper and was able to do so in the majority of cases. Music therapy was often used in conjunction with treatment as usual, and these findings show that method of implementation was the most effective way of implementing music therapy into one's life. Music therapy wasn't always shown to be more effective than treatment as usual, but it certainly was never less effective. Patients went into these trials with disorders ranging from autism to OCD to depression, and the overwhelming majority of patients saw symptoms of these disorders reduced.

Just to name a few, these symptoms ranged from having agitation, high heart rate, and confusion to symptoms such as sluggishness, lack of eye contact, and lack of desire to socialize.

Many more symptoms were discussed in this paper, and of course there are even more that have been studied outside of the ones discussed this paper. These symptoms all have different methods of treatment; some can be treated with pharmaceuticals (which vary heavily from one symptom or disorder to the next), some can be treated with meditation, and some can even be treated by eating certain herbs such as St. John's Wort (St. John's Wort and Depression: In Depth, 2018). Not many treatments are transdiagnostic, but music therapy certainly is one of the most transdiagnostic treatments available.

The major reason for this is that music therapy as a practice is quite versatile. With over 100 techniques in the United States alone, each able to be modified and tailored towards any number of patients, the possibilities of application are seemingly endless. No two people with the same disorder experience it identically, and thus their treatments shouldn't be identical either. For example consider two people with anxiety: one person may be socially anxious, whereas another may be anxious when alone. These two people may receive the same prescription, but they would receive two totally different treatments from a music therapist. If the goal is to make the person more social, they may start with one-on-one therapy and move to group therapy as time persists. If the goal is to make them comfortable with themselves, maybe an individual passive music therapy session where they are alone with their thoughts and music may be more beneficial.

Music therapy stimulates many areas of the brain simultaneously, which researchers have hypothesized is another possible reason for music therapy's success. The frontal lobe, temporal lobe, broca's area, wernicke's area, occipital lobe, cerebellum, nucleus accumbens, amygdala, hippocampus, hypothalamus, corpus callosum, and putamen all can be stimulated by listening to

or playing music, which are essential to music therapy (Music and the Brain: What Happens When You're Listening to Music, n.d.). This very large list covers a wide array of functions of the brain, a lot of which can be affected negatively by the disorders mentioned (as well as ones still needing research). With a list this comprehensive, it takes a little bit of mystery out of music therapy's success.

While the studies were promising for music therapy, their ability to generalize the results to a larger population was squandered because of sample sizes and lack of diversity. If one looks at the bigger picture as a whole, however, they can argue a lot of diverse research was conducted across multiple areas of mental health and wellbeing. No matter how someone wants to look at the scenario, one thing is for certain: music therapy is a very promising method of treatment for many different disorders and symptomologies. The catch to that is due to the limitations of research already done, and areas of research still yet to be tapped into, more research is still necessary to legitimize music therapy as a more mainstream option of alternative treatment.

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