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Chapter

Music and Its Healing Effects

Songül Mollaoğlu and Mukadder Mollaoğlu

Abstract

Music therapy, which is widely recommended for patients living with chronic problems, is actually a mind-body therapy. This therapy, which has been used clinically for more than a century, is one of the oldest treatment methods and is known to have been used in the treatment of patients in various cultures for four thousand years. Music therapy, known as simple harmonic movement, is rich in psychological and physiological effects. Used to support emotional, mental, and physical health, music therapy is an integrative art therapy method that provides a way to express feelings and experiences that cannot easily be expressed through words. Particularly in recent years, it has been observed that interest in traditional and complementary medicine in the field of health has increased worldwide. In this context, music therapy, one of the art therapy methods, attracts attention as a treatment method preferred by people among medical alternative treatment methods. In this section, the journey of music therapy from past to present and the neurophysiology of music are briefly explained and its effects on health problems are discussed in the light of findings in the literature.

Keywords: music therapy, healing effect of music, history of music therapy, physiology of music, integrative art therapy

1. Introduction

The word musica is taken from the Greek “mousike” or “mousa”. Nine fairy girls, who were considered the daughters of Zeus, the greatest god of the Greeks, were called “mousa” (mus). The ancient Greeks believed that these fairy girls were responsible for organizing the beauty and harmony of the whole world. It is accepted that the word music, which exists in almost all languages today, is derived from the root “muz” [1].

With the existence of medicine, music therapy has also existed. When we look at the use of music in medicine throughout history, it is seen that this association has always existed and continues until today. In ancient times, music was more common in belief-based use regarding the human soul. It is stated that the history of music therapy dates back to primitive tribes. According to the belief in primitive tribes, every being had its own voice and song. It was thought that the sound and song that a person would react to would be found by a sorcerer and the evil spirits inside him would be removed in this way and the cure would be cured. In addition, according to primitive tribes, diseases were caused by evil spirits and demons, and their treatment was done by a respected person called a shaman. According to mythology, Shamans would remove

evil spirits from the patient's body with rhythm and dance accompanied by music. In Christianity, church leaders used music as a treatment for mental illnesses [2, 3].

Apollo was a god believed to have played the lyre beautifully in ancient Greek mythology. He was considered the god of medicine. According to the belief in mythology, the music needed to relieve people's troubles and give them joy was performed by playing the lyre [4]. It is said that Orpheus, one of Apollo's sons, played the lyre very well. In ancient Greece, mathematician and philosopher Pythagoras also played the lyre. After Pythagoras, the basic thought and moral teachings of the classical Greek music movement developed with Plato and Aristotle [4, 5].

While Aesculape used the trumpet to treat deafness, Homera is known to have used music in surgeries and demonstrated its effectiveness. Plato stated in 400 BC that music gives tolerance and comfort to the individual by affecting the depths of the soul with harmony and rhythm [6]. Egyptians used music during childbirth to reduce labor pain. In ancient Rome, Celsus and Aretius pointed out that music soothes the soul and is good for mental illnesses. It is reported that Confucius talked about the positive effects of music on people, that it calmed people and had beneficial effects on blood circulation [7].

In the late twentieth century, music therapy studies made significant progress, especially in the West. In the examinations, these studies appear as non-clinical studies as well as clinical studies. It is seen that music therapy in an experimental sense is also used in qualitative and quantitative research and is used especially to improve the physical and psychological conditions of patients during and after medical procedures [8]. Thomas Edison's invention of the phonograph in 1877 and his development of the disc recorder in 1886 were the beginning of the use of music in patient treatment in hospitals. As a result, music has been used in hospitals for therapeutic purposes since the first half of the twentieth century. The first studies were mostly conducted on anesthesia and analgesia applications. In the mid-twentieth century, researchers began to develop theories about the neurological basis of the effects of music and experimentally investigated the effects of music on physiological parameters [6, 9].

One of the first doctors who wanted to make music therapy available clinically was French neurologist Philippe Pinel. Pinel, who bases his studies on mental health on understanding people and advocates humanistic treatment methods, is known to advocate the use of music in treatment [4]. Dr. Willer Van der Wall took the first step in working on music therapy in America. In 1920, he conducted some research on music in hospitals and prisons in Pennsylvania and New York states and determined that music had positive contributions to people and had soothing and positive stimulating effects. The practice of music therapy as a profession was started during World War I. Music was used in hospitals to heal traumatic soldiers injured in war and to relieve their pain psychologically. Music therapy, which was accepted as a branch of science in America in 1977, has been used as an effective method in psychiatric diseases since the 1950s [10, 11].

The aim of music therapy studies that started in the hospital is to keep patients as involved in life as possible, to make them productive, to enable them to socialize, and to increase their adaptation to daily life. Art therapy by providing inter-institutional cooperation: It is a mental health specialty that uses the creative process in art to increase and improve the physical, mental, and emotional well-being of individuals of all ages [12].

This process, followed by music as a therapy method, has been used as an integral part of the field of music and health throughout human history. Today, music therapy, as a form of expression that helps people express their emotions and reflect their

unconscious emotions, adds meaningfulness to people's inner world. Today, music therapy has become a form of help sought for various reasons such as coping with the symptoms of chronic diseases, reducing the side effects of medications, strengthening the immune system, preventing mental depression, strengthening healthy behaviors, and preventing tension and loss of strength.

2. Physiology of music

Music therapy has a history of thousands of years and today it emerges as a globally accepted field of expertise. The relationship between music and therapy goes back a long way. In fact, it is one of the oldest treatment methods. It is said that it is used in different cultures and civilizations. Music, one of the art therapy methods, appeals to the feelings and thoughts of the living being. Music has its own elements. There are expression elements such as genre, structure, rhythm, and language. For music therapy purposes, musical features such as rhythm, harmony, and melody are used [6, 13].

In the last 20–25 years, music, many studies have been conducted on its effects on neurotransmitters, hormones, cytokines, lymphocytes, vital signs, and immunoglobulins. Especially in the last decade, there has been an increasing number of studies examining the psychological and neurological effects of music on patients and the benefits of music on health [10].

Music is a unique stimulus because it causes both physiological and psychological responses in the listening individual. Music therapy, known as simple harmonic movement, is rich in psychological and physiological effects. When there is an auditory stimulus force, it is perceived as moving in a series. It begins with the compression of air molecules in the external ear canal, reaches the tympanic membrane, and finally passes through the cochlea to reach the nerves in the somatosensory region. Music stimulation leads to psychobiological improvements in this pathway. This way creates many effects on the person who listens to music (**Figure 1**) [14, 15]. Listening to music affects the autonomic nervous system and serves a healing function by causing relaxation in the organism. The first place where the sound of music is perceived is the auditory center located in the temporal lobe of the brain. Music perceived in the auditory center stimulates the thalamus, medulla, hypothalamus, midbrain, and pons [14, 16]. Music that affects different areas of the brain can reduce pain, for example, by causing the release of endorphins and enkephalin. As a result of its effect on the right hemisphere of the brain, it causes some effects on the limbic system and psychophysiological reactions occur, creating a therapeutic effect. Brain waves can be accelerated or slowed down by music, and it has an anxiolytic effect by helping to coordinate muscle tension and movements. As the pressure on neurotransmitters in the center increases, mood changes are achieved and anxiety decreases by correcting the nerves in the medulla oblongata [14–16].

As mentioned above, music creates a therapeutic effect by affecting the autonomic nervous system and neuroendocrinal activities. As it is known, the center of emotions is the limbic system. The influence of emotions on the limbic system is also related to the fact that the music reaching the body is not loud and has a normal tone and pitch. Thus, music listened to in a normal tone can transform negative emotions or disturbing emotions into positive emotions in the limbic system [17, 18]. As a result of a series of neuroendocrinological activities and autonomic processes stimulated by the effect of music in the organism, differences in emotions and physiological parameters occur in individuals. The parasympathetic nervous system takes action, slowing down and

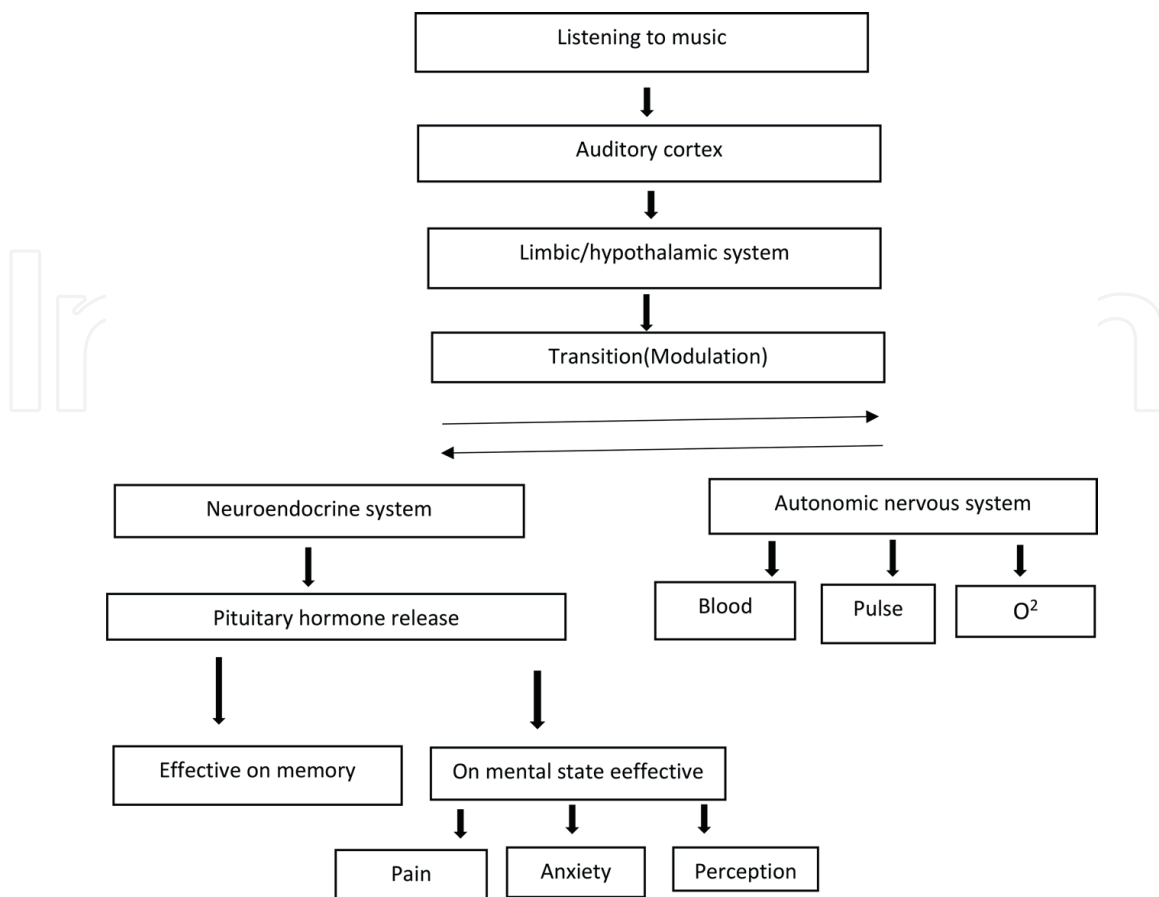


Figure 1.
Physiological mechanism of music therapy [14].

improving vital signs, especially breathing, blood pressure, and pulse. On the other hand, the pituitary gland, activated by the neuroendocrinological effect, accelerates the release of endorphin. Endorphins both regulate the mood in the organism and reveal the therapeutic effect of music through its natural pain-relieving effect, thus reducing both pain and anxiety levels in those who listen to music. It also enables people to perceive difficult situations more positively [18, 19].

Research conducted so far indicates that the effect of music on immune response and psychological and neurological diseases is due to its important effect on stress pathways. Studies on the subject have determined that there is a significant relationship, especially between music and dopamine, adrenaline, testosterone, and serotonin. These hormones, which affect the emotional state of the organism, have a positive effect on people who listen to music. Considering the relationship of these hormones with psychiatric diseases, it is known that music therapy is widely used especially in this field [6, 10]. Physiological effects of music therapy ranges from reducing psychophysiological stress, pain, anxiety, and isolation to inducing a change in behavior and altering mood. Research has shown a significant relationship between music therapy and pain and anxiety. In addition to other neurohormonal effects, music therapy has many benefits for the organism, such as reducing nausea and vomiting due to chemotherapy, reducing anxiety, and pain, improving sleep quality in people with sleep problems, and increasing the comfort of the person by distracting attention. As we mentioned before, music also has benefits in regulating pulse, respiration, body temperature, and blood pressure due to its effect on the autonomic nervous system [10, 20].

Thus, music therapy has been actively used in healthcare environments as a result of the stages it has gone through from past to present. With the development of modern medicine, it is now used as an alternative and complementary method to relieve the symptoms of diseases along with medical treatment. Below, the effects of music on some symptoms are discussed, using the physiological effects of music on humans.

3. Pain - anxiety and music

Pain is defined by the Taxonomy Committee of the International Association for the Study of Pain as “an unwanted emotional sensation or behavioral pattern related to the individual’s past experiences, originating from a specific area of the body, whether or not due to tissue damage” [21, 22]. It is thought that the positive effect of music on pain management is that it affects the autonomic nervous system and increases the release of endorphins, resulting in less pain perception. It is stated that music therapy, which has a very long history, has come to the fore again in recent years with the increasing interest in non-pharmacological methods [22, 23].

The process of neurophysiology of music and its effect on humans, the transmission of music, begins with the compression of air molecules in the external ear canal, reaches the tympanic membrane and finally passes through the cochlea and reaches the nerves in the somatosensory region. It is sent to the hearing area of the brain by nerve cells. The transmitted musical stimulus is first pushed upwards in the part of the brainstem called the lateral lemniscus. In the brainstem, music is first evaluated and analyzed. Music perceived by the temporal lobe, the hearing center, causes stimulation in the thalamus, medulla, hypothalamus, midbrain, and pons. The thalamus decides the state of music within the brain. The influence of the thalamus is important for the evaluation of musical information. The first cortex regions provide hearing and analysis is done from the temporal lobe, the thalamus receives this information, sends it to the relevant areas in the brain and the music spreads in an area. Thus, the right hemisphere works on the progression of the music, the left hemisphere makes the appropriate analysis [24, 25].

Music affects the right hemisphere of the brain, causes psychophysiological responses through the limbic system, and causes the release of enkephalin and endorphins, resulting in a decrease in the level of pain. Brain waves can be accelerated or slowed down by music, and it has an anxiolytic effect by helping to coordinate muscle tension and movements. As the pressure on neurotransmitters in the center increases, mood changes are achieved and anxiety decreases by rehabilitating the nerves in the medulla oblongata [25]. Music causes both physiological and psychological responses in the individual who listens to it. The individual is more influenced by the music of his own culture. Because they can establish healthier communication with the music of their own culture. Individuals’ understanding of music varies depending on the social and cultural structure of the society they live in and the education they have received [25, 26].

Studies conducted in different clinical settings report that music therapy is an effective intervention method, especially for intensive care patients. In Elliot’s study in 1994, the effects of music therapy on anxiety, pain, and muscle relaxation were examined in patients hospitalized in the coronary intensive care unit with a diagnosis of ischemic heart disease. The study revealed that music had a positive effect on these patients and increased their comfort, and the importance of music as a therapy method was emphasized [27]. A similar study was conducted by Bolwerk. In this

study, in patients with myocardial infarction in intensive care, it has been found that music is effective in reducing patients' pain and anxiety [28]. In another study, music therapy was used for the first time to reduce the pain and anxiety experienced by patients in the coronary intensive care unit and to increase the comfort of the patients [29]. Sullivan, in his study on patients hospitalized in coronary and surgical intensive care units, the patients listened to classical music, and it was determined that the patients' pain and anxiety decreased after music therapy [30]. Tse et al. in their study with experimental and control groups, investigated the effects of music therapy after nose surgery on postoperative pain, pulse, blood pressure, and analgesic use. They applied 30-minutes of music therapy to the experimental group patients intermittently for the first 24-hours after surgery and measured pain values 4 times during the intervention. As a result of the study, they showed that the pain level decreased significantly over time in the experimental group compared to the control group [31]. In their study with experimental and control groups, Allred et al. investigated the effect of music on postoperative pain. They randomly divided 56 patients who had knee replacement surgery into two groups. As a result of the study, they found that the pain averages of the patients in the experimental group decreased statistically significantly [32].

In a randomized controlled study conducted by Takmak et al. patients diagnosed with COVID-19 were listened to nature-based music, and its effect on stress, some physiological parameters, and adaptation to the prone position was evaluated. Accordingly, in the intervention group listening to music, the stress level decreased the oxygen saturation of the intervention group increased, and the time lying face down increased, compared to the control group. At the end of the study, the researchers concluded that listening to nature-based music in the prone position may reduce anxiety, increase adaptation to the prone position, and improve oxygenation and heart rate in conscious patients with hypoxemic respiratory failure [33].

In another study (2020), it was found that music therapy reduced the pain, anxiety, and depression levels of patients [13]. Music reduces muscle tension and affects the biological rhythm of individuals by causing brain waves to accelerate and slow down, affecting the parasympathetic nervous system, and increasing the release of endorphins [34, 35]. Chlan examined the effect of music on anxiety in patients receiving ventilator support and found that there was a decrease in the respiratory and pulse values of the patients in the music group [36].

4. Nausea-vomiting and music

Nausea and vomiting are common due to chemotherapy. Chemotherapy-related nausea and vomiting are the most common and serious side effects caused by chemotherapeutics. This is a common symptom in those receiving chemotherapy, and patients are very afraid of developing nausea and vomiting. It is recommended that music therapy be used in conjunction with other non-pharmacological methods to prevent chemotherapy-related nausea and vomiting. When the literature is examined, it is seen that many studies on music have been conducted with patients who have undergone bone marrow transplantation or solid organ transplantation, and as a result, music therapy is effective in reducing nausea and vomiting in these patient groups [37]. In the study of Rhodes et al. which investigated the effects of music therapy and visual imagery on the severity and duration of anxiety, nausea, and vomiting, they found that it significantly reduced the severity of nausea and vomiting and the duration of

vomiting also decreased [38]. Ezzone et al. showed less nausea and vomiting in a group of 33 bone marrow transplant patients who received music therapy [39].

2010 yılında Madden ve ark. Müzik ve dansı birleştiren ve kemoterapi gören hastalar için haftada 60 dakika uygulanan bir sanat formu tasarladı. [40] Deney grubundaki hastalar, kontrol grubundaki hastalara göre önemli ölçüde daha az mide bulantısı bildirdiler.

In a meta-analysis study conducted by Zhong and colleagues, seven articles applying music therapy to patients receiving chemotherapy were analyzed. This study determined that music therapy significantly improved symptoms of nausea and vomiting in patients with digestive system cancer during chemotherapy [41]. In the study by Doro et al. it was found that music therapy provided bio-psychosocial well-being by reducing nausea and pain in patients who underwent autologous hematopoietic stem cell transplantation [42]. According to a randomized study conducted by Madson and Silverman in a group of 58 patients who underwent solid organ transplantation, it was found that there was less nausea and vomiting in the music therapy group [43].

A systematic review and meta-analysis were conducted by Wei and colleagues to investigate the relationship between nausea and vomiting and music therapy. Cochrane Central Register of Controlled Trials (CENTRAL), PubMed, EMBASE, Cumulative Index to Nursing and Allied Health Literature (CINAHL), China Biomedical Database (CBM), China National Knowledge Infrastructure (CNKI) and WanFang were searched as databases for this study. A total of 608 studies were examined in these scanned databases. Ten randomized controlled trials met the criteria established for the study. A total of 632 patients were included in the study. The effect of music therapy applied to the patients was analyzed. The study was analyzed by comparing the effect of music therapy with the type of music, duration of listening to music, and frequency of listening to music. The results were that music therapy reduced the expected incidence and severity of nausea and vomiting [44].

In another study by Pozhhan and colleagues, sixty patients were equally randomized into experimental (music therapy group) and control (routine care group) groups. About 148 instrumental, recreational, and religious records were transmitted through headphones connected to an MP3 player. The intervention consisted of five 25-minute sessions supervised by trained nurses to provide the patient's favorite music, volume, and timing regulation. A 0–10 visual analog scale (VAS) and a 4-point Likert scale were used to measure the severity of nausea. Frequencies were also asked and recorded. Study endpoints were determined before, during, and after chemotherapy (8-hours, 16-hours, and 24-hours). The statistical tests performed were found to be statistically significant in favor of the music therapy group in terms of the median of nausea frequency, vomiting frequency, nausea severity, and vomiting severity between the music therapy and control groups. Music therapy reduced the frequency and severity of nausea and vomiting in the intervention group receiving chemotherapy compared to the control group. As a result, the authors suggested that music therapy should be included in the recovery process after chemotherapy in women with breast cancer [45].

Many chronic health problems arise with aging. One of these, high blood pressure, can cause serious complications if not controlled. In addition to pharmacological treatment, non-pharmacological treatment is also widely used in hypertensive patients. The effect of music on the autonomic nervous system is reflected in a positive effect on blood pressure, as discussed before. For this reason, in addition to

pharmacological treatment, music therapy can be used by taking advantage of the mechanism of music affecting the neurohormonal and autonomic systems.

Lorber and Divjak investigated the relationships between blood pressure and music therapy. This study was a random controlled study on elderly people in nursing homes. In the study, they aimed to reveal whether listening to music affects blood pressure, heart rate, and anxiety in the elderly. Thirty elderly individuals were randomly included in the experimental group and 30 elderly individuals were in the control group. Music therapy was applied to the experimental group. The experimental group that received music therapy was compared with the control group. As a result of the comparison, there were significant decreases in heart rate, systolic blood pressure, and anxiety in the elderly individuals in the experimental group. Thus, researchers said that as a result of this study, music therapy can be used as an alternative treatment method. Moreover, the fact that it is cheap, does not cause any harm to the person, and is safe are stated as important reasons for the preferability of this method. [46].

Cao and Zhang conducted a meta-analysis study to evaluate the effects of adjuvant music therapy in hypertension patients and to shed light on the clinical management of hypertension. A total of 20 randomized controlled studies were included in the study. In these studies, it was determined that music therapy was applied to 1154 patients. The analysis of the study showed that music therapy lowered blood pressure, a vital sign. It was also found to have positive effects on both systolic and diastolic blood pressure. Similarly, music therapy reduced heart rate in this study [47].

Lomba and his colleagues investigated how music therapy affects blood pressure in their study “Effects of music on systolic blood pressure, diastolic blood pressure, and heart rate: a meta-analysis” in 2012. They compared the group that received music therapy and the group that did not. In this comparison, diastolic blood pressure was found to be significantly lower in patients in the music therapy group. Similarly, heart rate decreased in patients who received music therapy compared to patients who did not receive music therapy [48].

Alammar and colleagues wanted to examine the relationship between music therapy and heart rate in adults. For this purpose, they searched six databases (PsycInfo, MEDLINE, PubMed, CINAHL, and Cochrane Library). In this meta-analysis study, there were 194 studies on the subject from six databases. They included 12 studies from these studies. The data of 1.118 adult patients who took part in the studies accepted for the study were included. The patients had different medical diagnoses. At the end of the analysis of the study, it was determined that the heart rate of the patients in the experimental group (who received music therapy) decreased compared to the patients in the control group (who did not receive music therapy) [49].

5. Substance abuse and music therapy

Many studies indicate that one of the unique interventions that can cure drug addicts is music therapy. From past to present, music therapy has been applied variably as primary and secondary health care for people with alcohol, tobacco, and other drug addictions. The data obtained in studies conducted in the field of music therapy suggest that music can play a critical role in multifaceted research. Music can be used to motivate and engage patients with substance addiction, to reveal emotions and positive mood changes, and to reduce stress and anxiety. The purpose of music therapy in substance addiction is to save the person from substance addiction, to

encourage the change of existing behaviors that harm the individual or society, and to raise awareness of the basic bio-psycho-social factors that contribute to substance use problems [50]. In a study conducted by W. S. Mathis, he states that music therapy in drug addicts has a potential esthetic input that can prevent the increase of dopamine in the brain regions affected by drug use and reduce substance craving. In an experiment he conducted with Han, Mathis applied music therapy to a group with substance addiction and made another group listen to white noise. They observed that there was a decrease in the desire to use substances in the group that listened to music [51]. In a similar study, three different treatment methods were applied to the group with substance addiction to reduce drug cravings. To one of these groups, only music was administered, to the other, a desire-reducing drug was administered, and to another group, both were administered. As a result, data were obtained that the desire for substances decreased in the group that listened only to music [52].

In a 2008 study, Dingle and colleagues investigated the effect of music therapy on substance abusers' participation in group cognitive behavioral therapy. They sought to answer the question of whether music therapy enables drug addicts to participate in cognitive behavioral therapy groups. This study was conducted in a private hospital. A total of 24 people, 14 women and 10 men, participated in the research. A total of 24 surveys applied to a sample aged between 17 and 52 were analyzed. The aim was to include patients in cognitive behavioral therapy administered in groups at the hospital where the study was conducted. For this purpose, music therapy was applied to substance addicts for 7 weeks. At the end of the sessions, how many substance addicts participated in music therapy and their perceptions were examined. As a result of the review, it was seen that 75% of substance abusers participated in cognitive behavioral therapy for 7 weeks. During the sessions, it was determined that substance addicts participated in the cognitive behavioral therapy group with pleasure and their motivation increased. They received an average score of 4.3 out of 5. About 46% stated that they saw themselves as part of the group thanks to music therapy. About 83% said they would attend other music therapy sessions in the future. They said that in the future, music therapy would improve the sense of belonging to the group. In addition, this study determined that music therapy is effective in all substance use. It was also determined that it could be applied to all age groups and that music therapy increased participation and motivation in all age groups in the cognitive behavioral therapy group [53].

Another study was conducted at a smoking cessation clinic. Of the smokers who applied to the outpatient clinic, 53 were in the study group and 61 were in the control group. Thus, a total of 114 people were included in the study. While art therapy was applied to the study group, health education was given to the control group. Thus, some parameters were examined in two groups. Symptom checklist score, blood lipid level, and high-density lipoprotein cholesterol were evaluated along with smoking duration. In addition, serum total cholesterol amount according to smoking duration and lung function according to smoking duration were also examined.

Low-density lipoprotein cholesterol decreased statistically significantly in both the study group and the control group. Symptom control scores of the study group were compared with the control group. According to this comparison, scores decreased in both groups. However, the scores of the study group were lower than the control group and were found to be statistically significant. High-density lipoprotein cholesterol was examined in the control group and the study group. Although smoking durations were different, it was determined that the high-density lipoprotein cholesterol level in the study group was increased compared to

the control group. It was also determined that the smoking rate decreased in the art therapy group. Additionally, lung function tests were compared in both groups in this study, and both smoking cessation and smoking cessation rates decreased after the intervention. Moreover, it was determined that lung capacity improved significantly in the study group [54].

6. Sleep quality and music

In order for music to be perceived, sound waves must first reach the ear. A series of steps then begins that convert these sound waves into electrical signals in the brain. Eventually, the brain interprets these sounds and a triggering effect is created for a series of changes to occur in the organism. One of the daily life activities that music affects the brain is sleep. Music affects regulating cortisol levels and stress hormones in people. This effect increases the comfort of people by ensuring quality sleep. In addition, by triggering the release of dopamine, music makes the person feel good before going to bed and helps manage pain, which is a factor that negatively affects sleep. People react both physically and psychologically to musical activity. These responses to music have significant effects on reducing not only acute pain but also chronic pain. Another effect of music on sleep improvement is related to the autonomic nervous system. Music increases sleep quality and improves sleep by relaxing the autonomic nervous system, which automatically controls many systems such as the nervous system. It is known that listening to music has significant effects on the autonomic nervous system. The autonomic nervous system, which regulates breathing, heart rate, and blood pressure, has a healing effect on these functions with the influence of music.

A study was conducted by Kavurmacı et al. on university students. In this study, pretest and posttest were applied and a control group was used. An answer was sought to the question of whether music therapy affects students' sleep quality. In the study, students who received a total score of 5 or more according to the Pittsburgh Sleep Quality Index (PSQI), who did not have any neurological/psychiatric disorders, who did not have a hearing problem, who did not receive any medical treatment, and who volunteered to participate in the study were included in the study. In this study, after randomization was achieved, students in the experimental group were allowed to listen to music for 1 hour a day *via* a music player. The MPM music player was asked to keep the music volume below 70% from students. The control group was not allowed to listen to music or any other intervention. Both groups continued their normal routines, including sleep. No other intervention was made to either the experimental or control groups regarding sleep habits. Before the intervention, the Pittsburgh Sleep Quality Index was applied to both groups, and baseline values were determined. Then, after the music treatment was given to the experimental group, the Pittsburgh Sleep Quality Index was applied again as a final test. When these measurements were compared, the post-test scores showed that sleep quality was improved in the Experimental Group compared to the Control Group. This value was statistically significant. Music therapy, one of the non-pharmacological treatment approaches for solving sleep problems, has been recommended as a non-pharmacological method that can be used in all areas of health, as a painless, safe, and economical treatment method without any side effects [55].

Another study examining the relationship between music therapy and sleep quality was conducted on elderly people. For this purpose, elderly people living in nursing

homes were examined. The method of the study was pretest-posttest single group quasi-experimental. In the first stage, sleep quality was determined with a scale and the baseline value was obtained. Then, the elderly listened to music before going to bed at night, and their sleep quality was measured again as a final test. As a result, it was determined in the study that music therapy applied to the elderly before going to bed improved their sleep quality and they slept more comfortably [56].

7. Conclusion

It is known that the art of music has existed since primitive societies and has an important place in human life. Because people have expressed their joy, sadness, and love through the art of music in every period of their lives. Among the fine arts, music is the area where emotions are best expressed and have the highest social impact. Music, a phenomenon that has been going on since the existence of humanity, is inherently empowering, cathartic, and healing. For this reason, it seems that the use of music as a therapy method dates back to prehistoric times and a wide variety of cultures. Thus, music has played an active role in the belief systems of many civilizations and has been used to treat diseases. Literature review shows that music therapy is widely used in health fields with increasing interest due to its relaxing effect on the symptoms of chronic diseases. As a result of the neurophysiological physiological effects of music therapy in this literature study, it has been determined that music is an important complementary medicine method that reduces heart rate and blood pressure, provides relaxation, changes the patient's perception of pain, diverts attention, reduces nausea due to chemotherapy, and improves the quality of life in patients and healthy individuals. Music therapy, which has the potential to improve symptomatic treatment and quality of life measures, is necessary and important to be used routinely alongside medical treatment, especially in clinical areas.

Author details


Songül Mollaoglu¹ and Mukadder Mollaoglu^{2*}

¹ Faculty of Education, Department of Fine Arts, Sivas Cumhuriyet University, Sivas, Turkey

² Faculty of Health Sciences, Sivas Cumhuriyet University, Sivas, Turkey

*Address all correspondence to: mukaddermollaoglu@hotmail.com

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References

- [1] Rio RE, Tenney KS. Music therapy for juvenile offenders in residential treatment. *Music Therapy Perspectives*. 2002;**20**(1):89-97
- [2] Yıldırım M. Music healing: History, development, application in addictions and music therapy applications in Turkey. *Turkish Academic Research Review*. 2021;**6**(2):477-497
- [3] Tièschky T, Mastnak W. ARION psychovocal therapy—Funktionale Gesangspädagogik im psychiatrischen setting. *Psychiatrische Praxis*. 2016;**43**(8):450-452
- [4] Grebene B. *Müzikle Tedavi*. Ankara: Sanem Matbaası; 1978
- [5] Turfan BM. The effect of music applications on patients with multiple sclerosis. In: Afyon Kocatepe University Social Sciences Institute Music Department Master's Thesis. Afyonkarahisar; 2019
- [6] Karamızrak N. Ses ve Müziğin Organları İyileştirici Etkisi. *Koşuyolu Heart Journal*. 2017;**17**(1):54-57
- [7] Cleary T. Konfüçyüs Düşüncesinin Temelleri. Çev: Sibel Özbudun: Anahtar Kitaplar, İstanbul; 2000
- [8] Rogers P. Music therapy research in Europe: A context for the qualitative/ quantitative debate. *British Journal of Music Therapy*. 1995;**9**(2):5-12
- [9] Pratt RR. Art, dance, and music therapy. *Physical Medicine and Rehabilitation Clinics of North America*. 2004;**15**:827-841
- [10] Boşnak M, Kurt AH, Yaman S. Beynimizin Müzik Fizyolojisi. *KSÜ Tıp Fak Dergisi*. 2017;**12**(1):35-44
- [11] Colwell CM, Pehotsky CA, Gillmeister G, Woorich J. The Orff approach to music therapy. In: Darrow AA, editor. *Introduction to approaches in music therapy*. 2nd ed. USA: Silver Spring; 2008. pp.11-24
- [12] Malchiodi CA. Expressive therapies history, theory, and practice. In: Malchiodi CA, editor. *Expressive Therapies*. Newyork: Guilford press; 2005. pp. 1-15
- [13] Dai WS, Huang ST, Xu N, Chen Q, Cao H. The effect of music therapy on pain, anxiety and depression in patients after coronary artery bypass grafting. *Journal of Cardiothoracic Surgery*. 2020;**15**(1):81
- [14] Updike P. Music therapy results for ICU patients. *Dimensions of Critical Care Nursing*. 1990;**9**(1):39-45
- [15] Thaut MH. The future of music in therapy and medicine. *Annals of the New York Academy of Sciences*. 2005;**1060**:303-308
- [16] Nilsson U. The anxiety- and pain-reducing effects of music interventions: A systematic review. *AORN Journal*. 2008;**87**(4):780-807
- [17] McCaffrey R, Locsin CR. Music listening as a nursing intervention: A symphony of practice. *Holistic Nursing Practice*. 2002;**16**(3):70-77
- [18] Arslan S. *Dokunma, Müzik Terapi Ve Aromaterapinin Yoğun Bakım Hastalarının Fizyolojik Durumlarına Etkisi [thesis]*. Erzurum: Atatürk Üniversitesi Sağlık Bilimleri Enstitüsü; 2007
- [19] Kemper KJ, Danhauer SC. Music as therapy. *Southern Medical Journal*. 2005;**98**:3

- [20] Covington H. Therapeutic music for patients with psychiatric disorders. *Holistic Nursing Practice*. 2001;**15**:59-69
- [21] Raja SN, Carr DB, Cohen M, Finnerup NB, Flor H, Gibson S, et al. The revised international association for the study of pain definition of pain: Concepts, challenges and compromises. *Pain*. 2020;**161**(9):1976-1982
- [22] Altuntaş D, Efe E. Çocuklarda ağrı yönetiminde müzik: Lisansüstü tezler. *Ordu Üniversitesi Hemşirelik Çalışmaları Dergisi*. 2022;**5**(2):234-242
- [23] Stegemann T, Geretsegger M, Phan Quoc E, Riedl H, Smetana M. Music therapy and other musicbased interventions in pediatric health care: An overview. *Medicine*. 2019;**6**(1):25
- [24] Öztürk L, Erseven H, Atik MF. *Makamdan Şifaya*. 1. Baskı ed. İstanbul: Türkiye İş Bankası Kültür Yayınları; 2009
- [25] Karaaslan Ş. Müziğin Ameliyat Sonrası Ağrı Üzerine Etkisi [thesis]. Turkey: İnönü Üniversitesi Sağlık Bilimleri Enstitüsü; 2014
- [26] Uyar M, Korhan EA. Yoğun Bakım Hastalarında Müzik Terapinin Ağrı ve Anksiyete Üzerine Etkisi. *Derleme*. 2011;**23**(4):139-146
- [27] Elliott D. The effects of music and muscle relaxation on patient anxiety in a coronary care unit. *Heart & Lung*. 1994;**23**:27-35
- [28] Bolwerk CA. Effects of relaxing music on state anxiety in myocardial infarction patients. *Critical Care Nursing Quarterly*. 1990;**13**:63-72
- [29] Chlan L. Integrating non pharmacological, adjunctive interventions into critical care practice: A means to humanize care? *American Journal of Critical Care*. 2002;**11**:14-16
- [30] O'Sullivan RJ. A musical road to recovery: Music in intensive care. *Intensive Care Nursing*. 1991;**7**:160-163
- [31] Tse YMM, Chan FM, Benzie FFI. The effect of music therapy on postoperative pain, heart rate, systolic blood pressure and analgesic use following Nasal. *Surgery*. 2005;**19**:3
- [32] Allred DK, Byers FJ, Sole Lou M. The effect of music on postoperative pain and anxiety. *Pain Management Nursing*. 2008;**11**(1):15-25
- [33] Takmak Ş, Karaçar Y, Karaçar Hİ, Çelik GK. The effect of nature-based music intervention on adaptation and anxiety levels in patients with COVID-19 placed in the prone position: A randomized controlled trial. *Intensive and Critical Care Nursing*. 2023;**79**:103496. DOI: 10.1016/j.iccn.2.103496
- [34] Wu MH, Chang TC. Evaluation of effect of music on human nervous system by heart rate variability analysis using ECG sensor. *Sensors and Materials*. 2021, 2021;**33**(2):739-753
- [35] Zhao P, Zhao J, Liu H, et al. Effects of long-term exposure to music on behaviour, immunity and performance of piglets. *Animal Production Science*. 2021;**61**(5):532-539
- [36] Chlan L. Effectiveness of a music therapy intervention on relaxation and anxiety for patients receiving ventilatory assistance. *Heart and Lung*. 1998;**27**(3):169-176
- [37] Özdelikara A, Arslan B. Chemotherapy-induced nausea-vomiting to manage the use of complementary and alternative therapy methods. *Gümüşhane Üniversitesi Sağlık Bilimleri Dergisi/ Gümüşhane University Journal of Health Sciences*. 2017;**6**(4):218-223

- [38] Rhodes VA, McDaniel RW. Nausea, vomiting, and retching: Complex problems in palliative care. *CA: a Cancer Journal for Clinicians*. 2001;**51**(4):232-248
- [39] Ezzone S, Baker C, Rosselet R, Terepka E. Music as an adjunct to antiemetic therapy. *Oncology Nursing Forum*. 1998;**25**:1551-1556
- [40] Madden JR, Mowry P, Gao D, Cullen PM, Foreman NK. Creative arts therapy improves quality of life for pediatric brain tumor patients receiving outpatient chemotherapy. *Journal of Pediatric Oncology Nursing*. 2010;**27**:133-145
- [41] Zhong FP, Zhong J, Zhong MY. Effect of music therapy on chemotherapy-induced nausea and vomiting in gastrointestinal cancer: A systematic review and meta-analysis. *World Journal of Gastrointestinal Surgery*. 2023;**15**(3):471-479
- [42] Doro CA, Neto JZ, Kowalski S. Music therapy reduced nausea and pain of the patients undergoing hematopoietic stem cells transplantation autologous (randomized clinical trial). *Research Square*. 2020;**23**:1-10. DOI: 10.21203/rs.3.rs-25921/v1
- [43] Madson AT, Silverman MJ. The effect of music therapy on relaxation, anxiety, pain perception, and nausea in adult solid organ transplant patients. *Journal of Music Therapy*. 2010;**47**(3):220-232
- [44] Wei T, Tian X, Zhang F, et al. Music interventions for chemotherapy-induced nausea and vomiting: A systematic review and meta-analysis. *Support Care Cancer*. 2020;**28**:4031-4041
- [45] Pozhhan M, Sobhani S, Rasouli AS, Tohidinezhad. The effect of music therapy on chemotherapy-induced nausea and vomiting in women with breast cancer. *Indian Journal of Cancer*. 2023;**60**(1):87-91
- [46] Lorber M, Divjak S. Music therapy as an intervention to reduce blood pressure and anxiety levels in older adults with hypertension: A randomized controlled trial. *Research in Gerontological Nursing*. 2022;**15**(2):85-92
- [47] Cao M, Zhang Z. Adjuvant music therapy for patients with hypertension: A meta-analysis and systematic review. *BMC Complementary Medicine and Therapies*. 2023;**23**:110
- [48] Loomba RS, Arora R, Shah PH, Chandrasekar S, Molnar J. Effects of music on systolic blood pressure, diastolic blood pressure, and heart rate: A meta-analysis. *Indian Heart Journal*. 2012;**64**(3):309-313. DOI: 10.1016/S0019-4832(12)60094-7
- [49] Alammar K, Baker OG, Alotaiba A, Alkhunaizi A. The effect of music therapy on adult patients' heart rate: A meta-analysis. *Nurse Media Journal of Nursing*. 2022;**12**(3):423-436
- [50] Mathis WS, Han X. The acute effect of pleasurable music on craving for alcohol: A pilot crossover study. *Journal of Psychiatric Research*. 2017;**90**:143-147
- [51] Stamou V, Chatzoudi T, Stamou L, Romo L, Graziani P. Music-assisted systematic desensitization for the reduction of craving in response to drug-conditioned cues: A pilot study. *The Arts in Psychotherapy*. 2016;**51**:36-45
- [52] Yıldırım M. Müzikle Tedavi: Tarihi, Gelişimi, Bağımlılıklarda Uygulanışı Ve Türkiye'deki Müzik Terapi Uygulamaları/ music healing: history, development, application in addictions and music therapy applications in Turkey. *Turkish Academic Research Review*. 2021;**6**(2):477-497

[53] Dingle GA, Gleadhil L, Baker FA. Can music therapy engage patients in group cognitive behaviour therapy for substance abuse treatment? *Drug and Alcohol Review*. 2008;**27**(2):190-196

[54] Wang F, Chen Y, Li S. The effect of art therapy on reoccurring smoking among youths. *American Journal of Translational Research*. 2021;**13**(9):10633-10640

[55] Kavurmacı M, Dayapoğlu N, Tan M. Effect of music therapy on sleep quality. *Alternative Therapies in Health and Medicine*. 2020;**26**(4):22-26

[56] Sarıkaya NA, Oğuz S. Huzurevinde Kalan Yaşlılarda Pasif Müzikoterapinin Uyku Kalitesine Etkisi (effect of passive music therapy on sleep quality in elderly nursing home residents). *Psikiyatri Hemşireliği Dergisi-Journal of Psychiatric Nursing*. 2016;**7**(2):55-60