

# MUSIC THERAPY AND PAIN MANAGEMENT: A MULTICULTURAL PERSPECTIVE\*

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*A multicultural approach in studying the influence of music on man's perception of pain is presented. Reference is made to contemporary research in psychoneuroimmunology, pharmacology, anaesthesiology, neuropsychology, aesthetics of music and other disciplines, with regard to discovery of the ISO-principle, very important in the process of diagnostics and treatment, and in various fields of creative therapy. Reference is also made to the Gate Control Theory of Pain, and the importance of an interdisciplinary approach in development of various methods of therapy interventions is presented.*

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## Music Therapy and Pain Management: A Multicultural Perspective

There is a growing interest in the area of music therapy and pain management, with a proliferation of new approaches and research in this important topic. This is an area of really profound importance in music therapy because it directly addresses the most basic need of the lessening of human suffering. In the research, music is often referred to as an audioanalgesic music used for the purpose of pain reduction.

However, I think we need to keep in mind that pain itself is a very complex phenomenon that is influenced by a variety of factors, many of which are not at all correlated with the objective degree of physical trauma. Personal attitudes towards coping with pain may be connected to the totality of a person's life history, cultural values and previous experiences with pain that can increase anxiety and the apprehension of pain, and other related issues. With any group of patients experiencing similar physical trauma, each individual

will have a different experience of pain, and all influenced by various psychological and physiological factors that, in practice, are all inseparably related. In music therapy and pain management, it's really difficult to draw the lines between culture, psychology, neurology and the level of confidence inspired by the music maker. Research indicates that tension will increase the perception of pain, while a state of relaxation can reduce the experience. Therefore, a large portion of the pain-related music therapy research, in different ways, looks at the potential of music to both induce and support this state of relaxation. This phenomenon, in which music stimuli can serve to reduce stress and subjective pain, is one that seems to transcend cultural boundaries. Although the principal approach to pain management has been pharmacological, the recognition of pain as a multidimensional phenomenon has led to a growing interest in non-pharmacological approaches. These methods, which include music therapy, are not intended as substitutes for pharmacological treatment but rather as comple-

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mentary therapies. The music therapy research in this area has focused on the use of music to alleviate pain in relation to such areas as dentistry, surgery, medical procedures such as the debridement of burn patients, cancer pain and childbirth. Perhaps it is helpful to distinguish between the use of music by non-music therapists in the medical context, which we can call music medicine, in contrast with medical music therapy. In music medicine, music is the primary aspect of treatment without a therapist-patient relationship, while in medical music therapy both the music and the therapeutic relationship are of primary importance. Music medicine relies entirely on receptive techniques with prerecorded music, while medical music therapy takes advantage of a wide variety of active musical experiences such as personalized composition, improvisation and so on, while also including receptive music that is presented in an interactive way. In receptive uses of music in pain management, music typically serves as a distracter from pain, a relaxing agent, a conditioning stimulus and a provider of overriding sensory stimuli.

1. We begin with the music stimulus. At the affective level, music can alter mood, lift depressive symptoms, as well as promote relaxation and diminish anxiety.
2. At the cognitive level, music can serve as a distraction from pain, music choices give the patient a sense of control, and previous music skills can be utilized such as music performance and listening.
3. At the sensory level, music can affect the sensory component of pain through counter-stimulation of the nerve fibers.
4. Endogenous pain modulation – we can alter the response to pain stimuli from all of these perspectives.

The standard theories of pain relate well to the positive potentials of musical intervention. One theory is the fear-tension-pain model in which the fear of the anticipated painful procedure leads to increased tension and this, in turn, inten-

sifies the perception of pain. In relation to this theory, we can see that music can be an excellent stimulus for holding the patient's attention and distracting it away from the fear. Music also has the potential to induce relaxation, thereby reducing the muscle tension that intensifies pain perceptions. Of course, patient-selected music is important here as it provides a sense of security that, in turn, also facilitates relaxation.

Similarly, we can provide musical analogies to the Gate Control Theory of Pain. This postulates that while physical stimuli pass through the nerve endings, awareness and interpretation of the stimulation take place in the central nervous system. A neural "gate" can be opened or closed to varying degrees, in this way modulating incoming pain signals before they reach the brain. In this context, we can see that even when pain stimuli are occurring, there may be concurrent stimuli, such as music stimuli, that compete for the attention of the central nervous system. By the introduction of music, the perception of pain is reduced to the extent that the patient will focus on the music stimuli. There are similar psychoneurological processes in the perception of pain and music.

Music can serve as a stimulus for conditioning and is highly effective as a conditioned stimulus. This is first contingent upon the use of the patient's preferred music, then developing a positive conditioned response to the music before any adverse stimulus is introduced, in this way conditioning the music with pain reduction. The music can then be used in combination with biofeedback to help patients dealing with chronic pain.

### **Dichotic Music Listening**

In this approach we combine patient's selected sedative music and the therapist's voice-over transmitted through headphones. The music channel is heard in the left ear, and the sound is then processed in the affective right hemisphere of the brain, due to the contra-lateral connections of the two hemispheres. At the same time, the therapist's verbal directions are channeled to the

right ear and processed in the cognitively oriented left hemisphere, in this way maximizing the benefits of the integration of verbal suggestion and music. The recorded music becomes conditioned for the patient to reduce pain responses and then can be used in recorded form by the patient for a personal program of pain management as in biofeedback.

In dental procedures, a positive conditioned response to music can compete with the previously conditioned anxiety-provoking effect of the dentist's drill. Also, considering that the dental patient can control the volume of the music, this points to the role of the use of music as a masking agent that enables the patient to cover the sound of the drill.

Vibroacoustic music therapy has received attention, looking at music as a vibro-tactile stimulus. We can, beyond the auditory element of music, consider the positive effects of stimulating the skin with musical vibrations to alleviate pain. A considerable amount of vibroacoustic equipment has been developed, essentially musical tables or couches, on which the patient lies on padded speakers and is tactily massaged by the musical vibrations for pain relief. For example, arthritis patients experiencing vibroacoustic therapy reported more pain relief than those receiving just music or a placebo, and this is also being applied in sports medicine.

Music is often used to reduce pre-operative anxiety as well as post-operatively to control pain and promote wakefulness.

I recently had to undergo an MRI procedure myself. This procedure can be somewhat stressful and claustrophobic. While it is not physically painful, it can be stressful and psychologically uncomfortable. I requested to be able to listen to my own music selection during this 30-minute experience. I closed my eyes and focused entirely on the music, and found it much easier. The music was a distracter, it had positive associations for me, and it gave me a level of control in an otherwise vulnerable situation. Knowing the music, and its approximate 30-minute duration from beginning to end, the music became a pro-

gressive cue that guided me towards anticipating the end of the experience.

One study investigated the role of music in postoperative pain in abdominal hysterectomy patients. The experimental group experienced music listening sessions, while no music was provided for the control group. Pain ratings were then obtained immediately preceding and following the experimental and control conditions and, even with this simple musical intervention, the experimental group realized a significantly greater reduction in anxiety and pain than the control group.

In clinical practice in surgery, the music therapist typically meets with the patient in the admissions center and determines their music preferences as well as explores their imagery of the successful outcome of the surgical intervention. The therapist then meets with the patient just before they enter surgery and plays the music and focuses on relaxation, breathing and positive imagery. The therapist accompanies the patient into the operating room and continues the music through the induction of anesthesia. Of course, it is not the music alone that is effective here, and the presence of the music therapist is critical in guiding the music experience. It is significant that the music therapist is probably the only non-threatening, non-invasive caregiver in the surgical community.

Labor pain in childbirth is another area where music therapy has been effective. Music is used as a distracter from pain as a pre-conditioned relaxation stimulus and to cue rhythmic breathing. Many studies have supported that music-trained birthing mothers have experienced significantly less anxiety and pain in childbirth than non-musical control groups.

The debridement procedures of burn patients are notoriously painful. In comparing the effects on burn patients of patient-selected sedative music paired with progressive muscle relaxation techniques and verbal and visual suggestion during debridement, versus progressive muscle relaxation techniques without music, the patients with the music and PMR condition demonstrated

less pain behavior and lower heart rates than the non-music group. Children with burn injuries have worked with personalized song composition. The music therapist helps them to write songs expressing their fears, either with original, spontaneously created melodies, or by parodies of known songs, creating new words to familiar melodies.

In cancer-related pain research, for example, subjects selected from several types of relaxing music, or a controlled condition of no music, and were divided into groups that alternated between these two conditions. As one would expect, the mean percentage of pain relief in the music condition was significantly greater.

The Simontons are a team of American researchers whose work is well known. They presented positive imagery and relaxation to medically incurable cancer patients with less than a year of life expectancy and, as a result, half were still alive two years later. This research pointed to the effects of a positive emotional state on the immune response. Music therapy research has continued in this direction, integrating music and imagery and relaxation in behavioral research related to immune system responses, the growing field of psychoneuroimmunology. As the body responds to pain by producing chemicals that are the result of pain, chemicals such as endorphins are produced to reduce discomfort. The use of music can enhance the production of endorphins in pain management.

Let's consider some more active forms of music in pain management, and much of this is derived from clinical practice in pediatric music therapy. Children, being less informed, may be more fearful than adults when confronted with painful procedures. Active music therapy approaches can include personalized song writing, improvisation, imagery and/or playing music with the child and so on. Hospitalization usually means limited personal choices, and in music therapy, the children can choose an instrument or song and choose to play (or sing) the music of their choice, and perform it as they like, quickly or slowly, loudly or softly, and so on.

Through music, they have an emotional outlet for self-expression that reduces the tension that increases pain. Musically, we can even accompany the child's crying, by singing or toning with it, or by improvising a musical accompaniment that supports it. One child had a fear of a blood transfusion and refused to cooperate. In music therapy, the boy created a rap song about his fear and then gradually added positive statements into his rap such as "the needle will help be get better." When the nurse arrived, the boy sang his rap and then held out his arm to accept the needle. For children, music is so important in helping them to relax and be accepting of medical procedures. Music can also serve as an information agent, using song as a comforting way of giving the child advance information about medical procedures, or the people on the medical team, such as the doctors and the nurses.

For stroke patients, through neurologic music therapy, the rhythmic patterning of music helps to entrain new neurological pathways in the brain that can help regulate movement, as in gate training and in the relearning of other movements.

Finally, music can serve as a positive environmental stimulus. As an aesthetic medium alone, it can provide positive sensory stimulation in what, for a child or even an adult in the hospital, can often seem to be a sterile or even hostile environment.

In China, there is a growing practice of music electro-acupuncture. By attaching electrodes from the recorded sound source to the acupuncture needle, Chinese doctors have found that the musical stimulus is stronger or more varied than the ordinary electric current, and this prevents the body from too quickly habituating to an unchanging frequency. This technique is being used in anesthesia for a variety of surgical procedures in China, and the patients also hear the music on headphones, which adds an added dimension of psychological support.

Intrinsically related to the effect of music and pain management, as in most therapeutic interventions, are the attitudes of the patients towards the treatment: the belief system which they hold

towards the potential value of the role of music in helping them to cope with pain.

What kind of belief system do patients in music therapy and pain management bring to the experience? How would this compare with the belief system of patients participating in traditional healing rituals? Frank carried out the classic research in the 1970s which demonstrated, as he stated, that "The success of all methods and schools of psychotherapy depends in the first instance on the patient's conviction that the therapist cares about him and is competent to help him," and he was thinking cross-culturally. Functionally, this means that in any kind of therapeutic intervention, it doesn't matter so much what you believe, as long as you believe it! Probably most clients in music therapy, unless they are long-term patients with a history of receiving music therapy services, approach it for the first time with a neutral, or even skeptical attitude, with most clients generally bringing little or no prior knowledge of the treatment, or belief in the power of the therapist.

This is, of course, in dramatic contrast to the context of traditional music and healing rituals, where both patients and healers begin with an identical, shared and unquestioning belief system in relation to the power and effectiveness of the ritual and the essential role of music within the cultural context.

The belief system as supported by the proven power of the placebo effect, can play a critical role in both modern and traditional healthcare practices.

In traditional cultures, there is a high level of positive expectations from healing interventions. And, even in modern medicine, placebos are known to be 55 to 65 percent as effective as most active medications such as aspirin and codeine for controlling pain. In traditional healing, the expectation of symptomatic relief implies a positive image of the self without pain, and the positive expectation and related imagery reflect the patient's belief system. Similarly, in music and imagery work, particularly in those applications that focus on music and relaxation and imagery

in pain management, identical processes are taking place.

Taylor has given us a biomedical theory of music therapy. In this, he has explained how, in the process of music and pain reduction, analgesia-producing neural circuits induce the release of opiates that ultimately inhibit the activity of neurons that transmit pain messages to the brain. However, this neurological process cannot take place without some level of patient confidence. If the patient resists the music or the treatment, and therefore does not begin to relax, then the treatment cannot be effective. Therefore, the belief system comes first. The presentation of music follows, and the neurological processes of pain reduction, if they occur at all, can only occur as a result of a music and pain reduction combination that inspires patient confidence.

### **Anastenaria**

An interesting comparison between music therapy with burn patients, and a traditional ritual, with interesting analogies, is a ritual in Greece known as anastenaria. This is a ritual connected with the Greek Orthodox Church. Prior to the actual firewalking event, the participants spend several days in preparation. During this warm-up period, they dance for many hours a day in a small chapel, in front of a group of religious icons of the saints. The dance is accompanied by wonderful music – an endlessly repeated melody performed by four musicians on drums, *guida* – the Greek bagpipes, vocal and the *lyra*, a bowed string instrument. The music is repetitious, hypnotic and trance inducing. As the participants dance to this special music, the combination of the music with continuous dancing and the visual power of the icons, all work to build up their faith – their belief that they can walk on burning coals without pain.

I think this ritual makes a really striking comparison with music therapy and burn patients undergoing debridement procedures. The patient in debridement is undergoing a painful treatment and may be able to obtain some relief through distracting music therapy techniques. In anaste-

naria, the pre-existing belief system helps to support the music-induced trance, positive imagery and the music conditioned expectation of no pain. As a result, the individuals who walk on the hot coals – seemingly the ultimate in pain-inducing burn stimuli – do so with no pain and no tissue damage.

With the debridement patients, the pain of burn treatments is reduced through music therapy. In anasthenaria, the music not only helps to entirely prevent the body from burn damage in response to what are normally burn inducing elements, it also entirely eliminates the pain response from this normally severe pain-inducing stimulus.

In anasthenaria, the participants have an unquestioning belief system in the power of the saints to protect them. This belief, symbolized and stimulated by the music in the ritual context, creates this wonderfully effective musical anesthesia.

In our work in music therapy, we are really at a major disadvantage as compared to traditional healers, or even compared to medical doctors. In the general public mind, music therapy doesn't yet have the credibility that traditional healing has to people in those cultures or that allopathic medicine inspires in modern Western culture. Perhaps in the future, with all the growing biomedical research in support of music therapy, music therapists will eventually inspire the same level of patient confidence that traditional healers and medical doctors do, and the enhanced belief system will make our work that much more effective.

I also think it is interesting that, in music therapy practice, we have no real analogy to the established music and healing repertoire that is so characteristic of traditional cultures. These cultures have developed musics which have been created for the specific purpose of healing and for no other purpose. Immediately recognizable by the patients, the music is pre-conditioned to support a healing belief system. By contrast, most of the non-improvised music that we utilize as music therapists is music that was composed

for other purposes, such as popular or classical music created with an aesthetic intent, but still not for therapeutic purposes – it is not pre-conditioned for therapy.

**Korea** Another interesting ritual related to music and pain is found in the kut ceremonies practiced by Korean traditional healers. In one ceremony which I observed outside of Seoul, the purpose of the ceremony was to call upon the spirits to protect the land from commercial development. At the climax of the ceremony, the shamanic healer, Mr. Pang, jumped up and down in bare feet on some very sharp agricultural knife blades with a powerful ongoing music support, all to demonstrate the protective presence of the spirits. He emerged from this experience with no tissue damage or bleeding as a result of abuse that normally would have caused severe physical trauma. As in anasthenaria, the point here was to prove the power and presence of the spirits, and the very same principles are at work, integrating music, the belief system and pain reduction. Therefore, whether it's walking on hot coals or jumping on knife blades, both of these take place without pain or physical trauma. While not specifically intended as strategies to help people better cope with pain, they do, in fact, result in the complete elimination of pain and effectively become a totally realized method of musical anesthesia. A final music therapy approach to pain management is called music-mediated imagery, the work of American music therapist, Mark Rider, which integrates personalized music improvisation, imagery and entrainment. In this work, a group of therapists create improvised music in response to the character of the patient's verbal descriptions of his pain. The music makers sit in a closed circle around the reclining patient, their physical proximity to the patient possibly giving the music some vibroacoustic benefits as well. The therapists asks the patient to verbally describe their pain symptoms, and the patient's descriptions of pain might include adjectives like sharp, intense, pulsing, intermittent and so on. The idea is to create a kind of

musical and psychological entrainment matching the patient's pain with this personalized, improvised music. This also reflects the established ISO principle in music therapy which suggests the importance of musically always meeting your patient at their emotional level before you move to redirect their feelings. Then, the therapist gradually guides the patient to imagine and try to feel the pain progressively reducing, while at the same time directing the improvised music to gradually diminish, in this way supporting the imagery of pain reduction. In conclusion, I would suggest that much can be learned from traditional rituals that may provide new perspectives that will contribute to the ongoing development of the already wonderful diversity of established procedures in medical music therapy. A constant seems to be the potential of music to sustain positive imagery regarding pain expectations, which again is connected to the patient's belief system. I feel that Rider's work in music

mediated imagery, of current music-pain approaches, comes closest to approaching the power and effectiveness of some ritual practices. Perhaps this, and other music therapy approaches to pain management, can be expanded in the future to include exploration of their potentials in, for example, taking patients into deep states of musically induced anesthesia. This would be a non-pharmacological anesthesia, to sustain patients throughout the most serious and intrusive surgical interventions, without any of the potentially negative side effects that may be associated with chemical anesthesia which many patients are unable to tolerate. Music and pain management is a fast-evolving area of music therapy practice, at the cutting edge of medical music therapy with its integration of concepts derived from music therapy, psychology and neurology. These approaches have unlimited potentials to provide non-invasive pain relief for a broad spectrum of patients.