CHAPTER III  
REVIEW OF LITERATURE, RELEVANCE, OBJECTIVES AND HYPOTHESES

Music can affect the functions at the basic sensory level as well as that on an unconscious level. Music is an inexpensive, non-pharmacological, noninvasive nursing interaction that has no side effects that can be effective along with the other methods. According to the Hendrick (2011), "The evidence suggests that music interventions may be useful as a complementary treatment to people with cancer". Says Bradt (2015), in a news release: "Music interventions provided by the trained music therapists as well as listening to the pre-recorded music both have shown positive outcomes in this review, but at this time there is not enough evidence to determine if one intervention is more effective than the other".

Music therapy has been associated with a reduction of pain and anxiety in addition to enhancing communication and spiritual well-being. Music therapy is a clinical and evidence based practice of using music intervention to accomplish individualized goals within a therapeutic relationship (AMTA, 2014).

Music therapy (provided by qualified music therapists, who engage the patient in live music experiences, including singing, songwriting, improvisation, and receptive methods) has an important role to play in the management of symptomatic issues within palliative care. A growing body of clinical work suggests that music therapy is effective in addressing physical (O’Callaghan, 1996; Trauger-Querry, Haghighi, 1999; Daveson, Kennelly, 2000; Magill, 2001; Hogan, 2002; Groen, 2007), emotional (West, 1994; Ibberson, 1996; Hogan, 1998; Krout, 2003; Aldridge, 2004; Clements-Cortes, 2004; Hilliard, 2005) and spiritual (Robertson-Gillam, 1995; Foxglove & Tyas, 2000; Salmon, 2001; Magill, 2005; Wlodarczyk, 2007) needs of palliative care patients.

The effectiveness of music therapy for oncology patients has been documented in numerous descriptive and experimental studies. Most of the researches with the acute cancer patients receiving chemotherapy, surgery or stem cell transplantation
examined the effectiveness of the receptive music therapy. Listening to music during chemotherapy, either played live by the music therapist or from tape has a positive effect on the pain perception (Bailey, 1983; Zimmerman, Pozehl, Duncan & Schmitz, 1989; Beck, 1991), relaxation (Bailey, 1983; Beck, 1991; Hanser, Bauer-Wu, Kubicek, Healey, Manola, Hernandez et al., 2006), anxiety (Bailey, 1983; Standley, 1992; Sabo & Michael, 1996; Ferrer, 2007) and mood (Weber, Nuessler & Willmanns, 1997; Hanser et al., 2006). They also found a decrease in the diastolic blood pressure or heart rate (Hanser et al., 2006; Ferrer, 2007) and an improvement in the fatigue (Ferrer, 2007). In a study by Bozcuc, Artac, Kra, Ozdogan, Sualp, Topcu et al. (2006), insomnia and appetite loss could be significantly decreased in the patients older than 45 years.

Listening to music has many beneficial effects on oncology patients. Listening to music as receptive form of therapy can be easily introduced into clinical situation. Patients receiving chemotherapy often experience harsh side effects, such as nausea, difficulty in breathing, and many flu-like symptoms. Patients receiving radiotherapy often experience anxiety, fear, stress or sense of loneliness. Listening to the recorded music while receiving those forms of treatment that can help to take patients’ minds away from the discomfort caused by the treatment and helps them cope with high levels of stress, fear and loneliness. Patients and their families also have an opportunity to participate in live music concerts. Live music can be used to create a mood of peace, relaxation, to improve the level of comfort, express feelings and emotions. Music therapists and patients often participate in spontaneous playing the instruments. Playing the instruments can facilitate a sense of control, as patients play an active role in creating the sounds and in setting the rhythm and mood (Bunt & Hoskyns, 2002).

Listening to music during the chemotherapy treatment effectively reduced treatment related anxiety and tension (Standley, 1992; Harper, 2001), was used for relaxation and diversion purposes (Weber, Nuessler & Wilmanns, 1997) and reduced nausea (Standley, 1992). In addition, the participants at a relaxation program developed at the Vancouver Center of the British Columbia Cancer agency reported that live music and imagery enhanced relaxation effects (Nicholson, 2001). Pfaff,
Smith, and Gowan (1989) have found that the music-assisted relaxation during bone marrow aspirations with six pediatric cancer patients reduced anticipatory fear, experienced pain, and experienced fear.

Music therapy also can be applied in patients with terminal cancer who live in hospices. Several studies with the hospice cancer patients or patients in a palliative situation have found out that quality of life (Hilliard, 2003), pain control (Krout, 2001; Gallagher & Steele, 2001; Gallagher, Lagman, Walsh, Davis & LeGrand, 2006), physical well-being and relaxation (Krout, 2001) was improved by music therapy. Gallagher et al. (2006) also found the improvements in mood, facial expression, body-movement, verbalization and shortness of breath.

The objective of this study was to identify the effects of the music therapy on the different types of the health problems such as anxiety, pain, fatigue, sleep quality, and affect in oncology inpatients. There is a dearth of research on comparing effectiveness of active and receptive music therapy and comparing the results of male and female cancer patients.

**Music therapy and anxiety**

Anxiety experienced by the critical care patients has been demonstrated to produce complex changes and physiological responses that may adversely affect the outcome of recovery (McKinley, Stein-Parbury, Chehelnabi & Lovas, 2004).

The psycho-physiological stress response involves the activation of the hypothalamic-pituitary-adrenal axis and sympathetic nervous system. It is characterized by the increased heart rate, blood pressure, and cardiac output. These stress responses put an even greater strain on an already compromised cardiovascular system. Anxiety is also a predominant emotion among patients suffering from serious medical conditions.

Music therapy may be used to encourage the emotional expression, promote social interaction, and relieve symptoms. While music therapy does not cure disease, there is much in the literature that reviews the capacity of music therapy to reduce some symptoms, aid in healing, improve physical movement, and enrich a patient’s quality of life. At our facility, often discomforts or anxieties are due to the
anticipation of the pain during the process of sheath insertion, immobilization, injection of contrast material, and balloon inflation (Dzyuin, 2012).

Music has long been associated with relaxation. As a familiar and aesthetic medium, music has the ability to ease anxiety, act as a diversion, and dispel the fear that accompanies the unknown (Stevens, 1990). The human body responds to stressors by producing chemicals such as endorphins that reduce distress (Sarafino, 2006).

Groundwork research suggests that musical stimuli may influence biochemical production, subsequently reducing distress. One of the many objectives music therapy can be employed for is reducing assessed anxiety. Music therapy can decrease anxiety by enhancing emotional well being, regulating biological indicators, and increasing comfort through the normalization of an unfamiliar environment (Gfeller, 2008).

In an early study (Biller, Olson, & Breen, 1974), the effects of music and active or receptive participation (playing or not playing a tambourine) on state and trait anxiety were studied. While none of the results were significant, there appeared to be a strong tendency for “sad” music to decrease state anxiety more than the “happy” music condition.

Stoudenmire (1975) examined the effects of both muscle relaxation training and music on anxiety in 108 college females. Results indicated that both treatment conditions significantly reduced state but not trait anxiety.

Rymaszewska, Kiejna, and Hadry (2003) studied the incidence and course of self-reported depression and anxiety in coronary artery bypass graft patients. A total of 53 patients admitted for coronary artery bypass surgery were examined a few days before and after the operation and 3 months after coronary artery bypass surgery. The subjects completed the Spielberger Anxiety questionnaire and Beck depression inventory. The results showed, approximately, 55% of the patients had high level of anxiety pre-operatively. Shortly after the surgery, 34% of the patients and after 3 months 32% of them had clinically relevant level of anxiety. 32% of the patients before the surgery, 28% immediately after coronary artery bypass surgery and 26% at follow-up were depressed.
In another study using college students (N=18), Davis and Thaut (1989) assessed the effects of subject-selected music on state anxiety, perceived relaxation, and physiological measures. Findings showed that for all participants state anxiety was reduced and perceived relaxation increased; however, physiological parameters (muscular and autonomic) demonstrated an excited or aroused activity. Finally, while music appeared to have had significant effects on measures in the previous studies, in another study by Thaut and Davis (1993) there were no such differences found between music (experimenter-selected versus subject-selected) and no-music conditions on reducing anxiety.

Pfaff (1989), Burns (1999) and Haun (2001) in different researches found that for adult, as well as pediatric cancer patients, music is useful to decrease anxiety prior to or during surgical procedures. Weber (1996) and Clark (2006) also in their trials realized that music therapy is effective to decrease tension during chemotherapy or radiation therapy.

Straw (1991); Smith (2001); Harper (2001); Kwekkeboom (2003); Burns, Azzouz, Sledge, Rutledge, Hincher and Monahan (2008); Binns-Turner (2008); Bufalini (2009); Bufone (2009); Wan (2009) and Danhauer (2010) examined the effects of music interventions on anxiety in participants with cancer they found that music therapy is effective to reduce the oncology patients anxiety.

At present, several scientific studies show the benefits of music on anxiety, anguish and depression (Lin, Hsieh, Hsu et al., 2011).

Another study shows the efficiency of this mediation with the patients with dementia disorders. It allows treating anxiety disorders and depression but also helps to relieve the main caregiver considerably improving the morale of this person. The music would be an excellent mediator to restore social ties, family ties but also emotional (Guetin, Portet, Picot, Defez, Pose, Blayac et al., 2009).

In acute myocardial infarction patients, several investigators have studied the effects of the relaxing music on decreasing the anxiety in the people (Bolwerk, 1990; Davis-Rollans & Cunningham, 1987; Elliott, 1994; Guzzetta, 1989; White, 1999; Zimmerman, Pozehl, Duncan & Schmitz, 1989).
McBride, Graydon, Sidani and Hall (1999) examined the therapeutic use of music for anxiety and dyspnea in patients with Chronic Obstructive Pulmonary Disease who live at home. Pharmacological and non-pharmacological anxiety management practices and patient and clinician reports of anxiety were studied using the Spielberger state anxiety inventory (2010) with patients who were diagnosed with an acute myocardial infarction (Frazier, Moser, O’Brien et al., 2002).

Recorded music has been effective in managing anxiety for patients before, during and after undergoing surgery, (Robb, Nichols, Rutan, Bishop & Parker, 1995; Koch, Kain, Ayoub & Rosenberg, 1998; MacDonald, Ashley, Davies, Serpell, Murray & Millar, 1999; Hermal, 2001; Mok & Wong, 2003) and in reducing anxiety for patients on ventilators (Chlan, 2000; Wong, Lopez-Nahas & Molassiotis, 2001) and for those undergoing medical examinations/procedures (Sabo & Michael, 1996; Weber, Nuessler & Wilmanns, 1997; Chlan, Evans, Greenleaf & Walker, 2000; Salmore & Nelson, 2000; Haun, Mainous & Looney, 2001; Smolen, Topp & Singer, 2002).

Straw (1991) in his trial compared guided imagery and relaxation training to music listening and found that both interventions significantly reduced state anxiety. An ANCOVA analysis with pre-test anxiety scores as covariate indicated that the difference in effect of the two interventions on state anxiety was not statistically significant.

In the surgical arena, Cowan (1991) described the effectiveness of a music therapy protocol using recorded music and the therapist (as a transitional object) to alleviate anxiety before, during, and after procedures. Davis (1992) identified music listening and relaxation instruction as an effective means of reducing pain and anxiety in a number of patients undergoing painful, gynecological procedures. Other investigations have been carried out using music therapy with oncology patients.

Brodsky (1989) described how music therapy, incorporating song activities, could be used to resolve anxiety in oncology patients confined to isolation rooms. Decreases in socialization, motor activity, and stimulation were addressed through singing and song writing with instrumental accompaniment. These musical
experiences afforded individuals the opportunity to express emotions associated with their hospitalization and strengthen coping strategies. Pfaff, Smith, and Gowan (1989) utilized a self-report scale (for pain and fear) and a behavioral observation scale to assess the effectiveness of music-assisted relaxation intervention (MRI) techniques for children undergoing bone marrow aspirations. Using a within-subjects experimental design, the authors examined whether or not MRI had a significant effect on fear and pain. Self-reports indicated that the use of MRI was useful in reducing anxiety and pain; however, no indication of a reduction in total observed behavioral distress was found.

A study by Calovini (1993) with 11 terminally ill patients, examined state anxiety levels within one music therapy session. A four-item questionnaire, and before and after readings of blood pressure, pulse rate, and extremity temperature were taken. The physiologic measures were also taken every 15 minutes during the music therapy intervention. The study found that state anxiety was not statistically significantly affected by one session of music therapy. However, systolic blood pressure and pulse rate decreased, and finger temperature increased for the participants, which may indicate a trend toward reduced anxiety.

In O’Brien’s survey (1999) assessing the effectiveness of music therapy in meeting patient needs 45% of patients surveyed stated that music therapy was extremely helpful in reducing anxiety, 38% stated it was helpful and 17% stated it was quite helpful.

Gallagher and Steele (2002) also investigated the effectiveness of music therapy. Visual analogue scales measured patients before and after music therapy sessions on symptoms including pain, anxiety, nausea, and depression. Music therapy was found to significantly reduce anxiety, and pain as well as improve mood.

Yung, Chuikam, French and Chan (2002) studied the effect of music on preoperative anxiety in Chinese men undergoing transurethral resection of the prostate. The study was designed as quasi-experimental with the three groups such as music intervention, nurse presence and control group. A reduction in the anxiety level was found for the music intervention group.
Additionally, Cassileth, Vickers and Magill (2003) found participants with cancer in their experimental group scored 28% lower on the combined anxiety and depression scale and 37% lower on the total mood disturbance scale after they received three to seven group music therapy sessions.

Cook (1986) in a randomized control trial studied the effect of music on preoperative anxiety in the day of surgery. The reduction in the anxiety level of the music intervention group was statistically significant.

A further study by Gallagher, Lagman, Walsh, Davis and LeGrand (2006) evaluated the effect of music therapy on anxiety, as well as a number of other symptom issues. Visual analogue scales implemented before and after music therapy sessions found that anxiety was significantly reduced.

Horne-Thompson and Grocke (2008) in a study measured effect of music therapy on anxiety in Twenty-five patients who were terminally ill. Result of their study demonstrated a significant reduction in anxiety for the experimental group on the anxiety measurement. Results of another investigation showed that the participants who listened the music had lower state anxiety and the pain levels than those who did not listen to the music (Shabanloei, Golchin, Esfahani, Dolatkhah & Rasoulian, 2010).

A mixed method study by Thompson (2011) investigated the impact and effect of group music therapy on anxiety, and the experience of music therapy for women with breast cancer. Four groups of 18 women at different stages of the disease trajectory received 6 weekly music therapy sessions that incorporated various music therapy methods. The results have shown no detected changes on the depression anxiety scale on post-test.

Pfister and Jones (2011) studied use of music to minimize preoperative patient Anxiety. All participants were allowed to listen to a provided database of music via individual MP3 players. After 20 minutes, patients were given post surveys to reassess their level of anxiety. In the pre-survey, 55% of patients thought music would be helpful and 78% felt that listening to music helped relieve anxiety on the post-survey.
Bradt, Dileo, Grocke, and Magill (2011) conducted a systematic review and meta-analysis examining the improvement as a result of music-based interventions on psychological and physical outcomes of cancer patients. Results indicated that music-based interventions have a beneficial effect on anxiety, quality of life, mood, and pain with small reductions in heart rate, respiratory rate, and blood pressure.

Investigators in Southern Taiwan studied the effects of music therapy and verbal relaxation on anxiety in outpatients receiving chemotherapy. (Lin, Hsieh, Hsu et al., 2011). They randomly assigned 98 patients to 3 groups: music therapy, verbally guided relaxation, and standard care. Efficacy was measured using the Spielberger state-trait anxiety instrument (1970) during and after chemotherapy. The researchers found that music therapy had a greater positive effect on post-chemotherapy anxiety than did verbal relaxation or control groups. Patients with high baseline anxiety receiving music therapy had a greater drop in post-chemotherapy anxiety than did those with a predefined “normal” state of anxiety in a subset analysis.

Dogan and Sentoran (2012) lead an experimental study on “effect of music therapy on the level of anxiety in the patients undergoing coronary angiography”. The study group (100 patients) listened to music throughout the intervention, whilst the control group (100 patients) didn’t listen to music. It was found there is difference between the mean state anxiety scores obtained before and during the coronary angiography. And it was significantly higher in the study group than the control group. It was concluded that the music listened to during the coronary angiography process had an impact on the intraoperative anxiety levels of the patients.

Pothoulaki, MacDonald and Flowers (2012) indicated positive effects of music therapy interventions on a range of psychological and physiological responses including reduced stress and anxiety levels, improved mood, and enhanced overall wellbeing and positive attitudes toward life.

Further by Hye-Young, Choi and Yeo-Jin Yi (2013) the effect of the music therapy was examined on anxiety, depression and fatigue in cancer patient undergoing radiotherapy. This study was the nonequivalent control pretest-posttest design. The participants were 65 cancer patients (33 experimental and 32 control group) receiving
the intensity-modulated radiotherapy. Music therapy for the experimental group took 20-30 minutes per session for the five days while they were receiving radiotherapy. According to the authors that state anxiety, visual analogue scale anxiety and depression of the experimental group after the treatment were reduced but there was no statistical significance between the experimental group and control group before and after having treatment.

Romito, Lagattolla, Costanzo, Giotta and Mattioli (2013) found on a research that music therapy is effective on emotional expression during chemotherapy in breast cancer patients. They found that the experimental group had significant reductions in stress, anxiety, depression and anger. Anxiety and stress were reduced also in the control group, but the effect size was small.

Gutierrez and Camarena (2015) in their study propose music therapy as a novel approach in clinical psychiatry for generalized anxiety disorder, which is one of the most common and incapacitating mental disorders. The researchers programmed 12 sessions for this group of patients. A pre-test/post-test design using the Beck anxiety and depression inventory was used. The Wilcoxon statistical test for related groups in global scores demonstrated a significant reduction after the intervention. The results demonstrate that music therapy was effective in reducing anxiety and depression levels in patients.

**Music therapy and pain**

The World Health Organization (2014) reports that in 97% of all cancer cases pain can be controlled. People living with cancer life are precious, because of the prognosis. When pain become part of each day of life, if the pain is not taken care, these days are diminished and quality of life is eroded. In addition to medication, there are several techniques that can be useful in managing pain. These techniques can be used in conjunction with medication or in some cases can be used alone to effectively manage pain. Several alternative method of pain control for cancer has been sanctioned by the National Institute of Health.

Beck (1988) investigated the therapeutic effect of the music listening as an adjunct to scheduled analgesics for patients with cancer-related pain. Results
indicated that even though the music was perceived as relaxing and distracting, it did not always increase the patient’s sense of control over pain. Moreover, the effects of the music listening on pain varied significantly for every individual. Beck’s study (1998) indicated that even though the music listening may function therapeutically, responses are highly individualized. Therefore, the music interventions selected by a trained music therapy professional based on assessment and tailored according to individual needs, strengths and preferences may have a greater therapeutic potential.

Several authors indicated that pain is directly correlated to patient discomfort (Stanik-Hutt, 2003). Additionally, poorly managed pain may result in physiological and psychological complications that may compromise recovery and negatively affect both morbidity and mortality (Stanik-Hutt, 2003).

Summer & Punttillo (2001) recognized that pain is a stimulus for physiologic stress responses such as anxiety and restlessness. Halloran & Pohlman (1995) described pain and anxiety as comorbid conditions in critically ill patients. Conversely, anxiety may increase the perception of pain (Chapman, 1985). Treating this anxiety associated with pain leads to the promotion of patient comfort (Summer & Punttillo, 2001).

Music therapy addresses the multi-dimensions of pain; discomfort, displeasure, anxiety, insecurity as well as the motivational aspects of pain related to pain management. This research project also explores the use of music therapy as an intervention for pain perception. Pain is often considered the fifth vital sign in hospital settings and is recognized as an important piece of the nurses’ assessment of critically ill patients (Terai, Yukioka & Asada, 1998; Aslan, Badir & Selimen, 2003; Stanik-Hutt, 2003). Chlan (1998) described the music therapy as the therapeutic use of music to promote health and well being in the patients.

Researchers have examined the effectiveness of the music in pain in adults with the musculoskeletal trauma (Tanabe, Thomas, Paice, Spiller & Marcantonio, 2001), oncology patients (Franco & Rodrigues, 2009), stroke patients (Jun, Roh, & Kim, 2012), patients undergoing endoscopy of the upper gastrointestinal system (Uçan, Ovayolu, & Savas, 2007), patients undergoing colonoscopy (Ovayolu, Ucan,
Pehlivan, Pehlivan, Buyukhatipoglu, Savas & Gulsen, 2006), older people (Chan, Wong, Onishi & Thayala, 2011), the patients receiving mechanical ventilation (Lee, Chung, Chan & Chan, 2005), the hernia patients (Nilsson, Unosson & Rawal, 2005), and the cancer patients undergoing chemotherapy or radiotherapy (Vinayak, Dehkhoda & Vinayak, 2017).

Listening to music has been related to the dopamine release from the caudate and the nucleus accumbens (Salimpoor, Benovoy, Larcher, Dagher & Zatorre, 2011), and dopamine itself is known to have a role in central analgesia (Wood, 2008). Pleasant (consonant) and unpleasant (dissonant) music has an effect on the descending pain modulation pathway, increasing or decreasing the pain perception respectively (Roy, Mailhot, Gosselin, Paquette & Peretz, 2009).

Mitchell, Macdonald & Brodie (2006) found the familiarity with the music listened may be important to the analgesic effect and in a recent study we found that pleasant and relaxing nature sounds has the same analgesic effect as unfamiliar music (Villarreal, Brattico, Vase, Ostergaard & Vuust, 2012). Finally, the relaxation produced by the music that also influences the analgesic effect (Kenntnermabiala, Gorges, Alpers, Lehmann & Pauli, 2007; Rhudy, Williams, McCabe, Russell & Maynard, 2008).

The effect of music therapy on pain relief, physical comfort, relaxation and contentment was examined by Curtis (1986). Nine terminally ill patients participated, and three experimental conditions were used: no music, background sound, and music. While significant results were not achieved, individual responses showed that the background sound condition appeared to have a negative effect, and the music intervention a positive affect.

Schorr (1993) demonstrated the perception of pain was decreased when the women with rheumatoid arthritis listen to the music for 20 minutes. However, the lack of a control group reduced the ability to predict the music that was the only factor that caused the change in pain perception.

Kianfar, Shadvar, Mohoori and Azarfarin (2007) conducted a prospective study on pain after the cardiac surgery. Pain location, distribution and intensity were
documented on 250 consecutive adult patients on the first, second and third post-operative day. The result showed that maximum pain intensity which was significantly higher on post-operative day one and two and lower on post-operative day three.

Good, Anderson, Stanton-Hicks, Grass and Makii (2002) studied about the 500 patients for the measurement of the effects of music and jaw relaxation on the postoperative pain relief. The intervention was initiated on the day of the surgery and data, which was collected on the postoperative days one and two. Participants in the combination group that included both the interventions of relaxation and music had significantly less pain on all posttests. The researchers hypothesized that initiating these therapies for longer periods of time might increase duration of the treatment effect. Listening to the music has been shown to decrease the rheumatoid arthritis pain in women.

Palliative care teams frequently include music therapists as part of a multidisciplinary approach to the treatment of pain. Researchers case medical centre found that a single music therapy intervention incorporating therapist-guided relaxation and live music effectively lowered pain in palliative care patients (Gutgsell, Schluchter, Margevicius, McLaughlin, Harris, Mecklenburg et al., 2012). In this study, 200 inpatients were randomly assigned to standard care with vs. without music therapy. Significantly greater decrease in pain scores was seen in the music therapy group.

Pain is a common problem in the world (Peng, 2006; Reyes-Gibby, 2006), and 38% of newly diagnosed cancer patients and 81% of terminal oncology patients report pain (Chiu, 2000).

Pain activates the sympathetic nervous system (Green, Wang, Owen, Xie, Bittar & Stein, 2006; Leone, 2006) and at its worst, impairs quality of life (Mystakidou, 2004).

Unrelieved pain also results in anxiety, depression (Reyes-Gibby, 2006), helplessness (Hsu, 2003), hopelessness, desire to die (Mystakidou, 2004; O’Mahony, 2005), and fear in both persons with cancer and their families (Miaskowski, 2003).
Many studies suggest that the music therapy is an effective non-pharmacologic approach for pain management. An investigation by Tse (2005) explored the effect of the music therapy on the postoperative pain. In this research music was played intermittently to the members of the experimental group during the first day postoperative period. Pain intensity had been measured by using the pain verbal rating scales. Significant decreases in the pain intensity over time were found. In addition, the experimental group had lower systolic blood pressure and heart rate, and took fewer oral analgesics for the pain.

Researches revealed that listening to the music reduces acute and chronic pain (Guétin, Ginies, Siou, Picot, Pommié & Touchon, 2012; Korhan, Uyar, Eyigör, Yönt, Çelik & Khorshid, 2013).

Several studies have suggested that the analgesic effect of the music may be secondary to cognitive and emotional effects that arise from listening to music: distraction from the pain, pleasantness, and pleasure, memory evoked emotions and relaxation (Mitchell et al., 2006; Juslin & Västfjäll, 2008; Wiech & Tracey, 2009; Bernatzky, Presch, Anderson & Panksepp, 2011; Roy, Lebuis, Hugueville, Peretz & Rainville, 2012).

Distraction is a well-known cognitive analgesic mechanism (Tracey, Ploghaus, Gati, Clare, Smith & Menon, 2002; Villemure & Bushnell, 2009) that is present when listening to music. Also, listening to music has been related to dopamine release from the caudate (Salimpoor et al., 2011), and dopamine itself is known to have a role in central analgesia (Wood, 2008).

Pleasant and unpleasant music has an impact on the descending pain modulation pathway, increasing or decreasing pain perception, respectively (Roy, Mailhot, Gosselin, Paquette & Peretz, 2009).

Many studies conducted have demonstrated the music therapy had positive effects on pain and improved quality of life in ill and healthy individuals (Chan, Lee, Ngan, & Wong, 2003; McCaffrey & Freeman, 2003; Richards, Johnson, Sparks & Emerson, 2007).
Tanabe, Thomas, Paice, Spiller and Marcantonio (2001) found in their study that the music therapy decreased the severity of pain in patients with musculoskeletal trauma who presented to the emergency department. In another study made by Evans (2002) where the results of 29 studies were evaluated, it was found that music therapy was used to reduce individuals’ perception of pain, eliminate the side-effects of the care and treatment, and increase their satisfaction with the care.

In a quasi-experimental design study the effect of music therapy on patients with acute musculoskeletal injuries was demonstrated. All participants in the experimental group received the usual care plus music therapy by the headphone, whereas those in the control group received only the usual care. The music therapy consisted of around fifty different light music or the folk songs as assigned by the project panel. There is no significant different at baseline in term of demographic data and pain level, anxiety level (Yau, Wong & Chan, 2012).

According to Frank (1985), Ezzone (1998) and Bozcuk (2006) music is useful to lessen treatment side effects such as pain in oncology patients. Beck (1989) and Akombo (2006) also claimed music can be used to enhance pain management in cancer.

Beck (1989) in a trial compared the effect of music to other interventions. He used a 60-cycle hum as the placebo condition in a crossover trial and found that music listening led to greater pain reduction than the placebo condition in 36 participants.

Zimmerman, Nieveen, Barnason and Schmaderer (1996) and Cholburi (2004) both reported significant pre to post treatment reductions in pain using 30 minutes of preferred music among hospitalized patients with cancer pain.

Sahler, Hunter and Liesveld (2003) found patients reported a decrease in pain and a sense of nausea following a music therapy intervention. He found blood and marrow transplantation patients reported a significant decrease in self-reported pain after following bi-weekly music therapy sessions.

Kwekkeboom (2003) compared the effects of music listening, audiotape, and standard care on procedural pain and found that participants did not like wearing the headsets as it prevented them from hearing the surgeon, causing greater anxiety and
suggests that increased anxiety leads to increased pain perception. Mitchell et al. (2006) discovered concerning interventions focusing on pain reduction, patient-preferred music listening greatly increased patients’ tolerance to pain and enhanced perceived control over pain.

Clark (2006) found that music therapy resulted in greater pain reduction than standard care. Therefore, a subsequent analysis excluding his data resulted in a moderate effect of music on pain perception in 391 participants with cancer. Shaban (2006) compared progressive muscle relaxation to music listening and found that progressive muscle relaxation was more effective in reducing pain than listening to pre-recorded music in 100 participants.

Beck and Kwekkeboom (2009) however, found no differences in pain when music listening was compared to a control condition (white noise, book on tape, or resting quietly). Bradt, Dileo, Grocke, and Magill (2011) conducted a systematic review and meta-analysis examining the improvement as a result of music-based interventions on psychological and physical outcomes of cancer patients. Results indicated that music-based interventions could have a beneficial effect on anxiety, quality of life, mood, and pain with small reductions in heart rate, respiratory rate, and blood pressure (Bradt, Dileo, Grocke & Magill, 2011).

A quasi-experimental study was done by Korhan et al. (2014) repeated measures design has been used in this research. Thirty patients, aged between 18–70 years, with neuropathic pain and hospitalized in an algology clinic were identified as a convenience sample. Participants received 60 minutes of the music therapy. Classical Turkish music was played to the patients using a MP3 and headphones. The results show the inclusion of the music therapy in the routine care of the patients with neuropathic pain could provide nurses with an effective practice for reducing patients’ pain intensity.

Gao, Chen, Lin and Han (2016) investigated the effects of music therapy on the pain behaviors and survival of rats with bone cancer pain. Animals were divided into experimental and control group, each with 10 rats. The animals in the observation group were given Mozart, played the sonata once every hour in the daytime, stopped
playing during the night, and this cycle was kept for 2 weeks. On the other hand, rats in the control group were kept under the same environment without music. Results shown after 1-2 weeks of treatment, spontaneous foot withdrawal reflection caused by pain in the experimental group was significantly lower than that in the control group.

Bradt, Norris, Shim, Gracely and Gerrity (2016) studied the effect of Vocal Music therapy for chronic pain management in African Americans. Fifty-five adults, predominantly African Americans, with chronic pain were randomized to an 8-week vocal music therapy treatment group or waitlist control group. Results showed lower pain in experimental group.

Gallagher, Lagman and Rybicki (2017) in an investigation studied outcomes of music therapy interventions on symptom management in palliative medicine patients. Among 293 patients, significant improvement in pain, anxiety, depression and shortness of breath scores was noted. In addition, 96% of patients had positive responses to participating in music therapy.

Selle and Silverman (2017) determined music therapy in the form of patient-preferred live music improves the pain in patients on a cardiovascular unit. 36 adult in-patients on a cardiovascular unit were randomly assigned to an experimental or a control condition. The results shown there are significant between-group differences in posttest measures of pain with experimental participants having more favorable posttest scores than control participants.

**Music therapy and fatigue**

Patients with the cancer-related fatigue may try everything from sleep aids to herbal medicines to art therapy to hypnosis. Because the cancer-related fatigue can last for years after treatment, nurses in all settings are likely to encounter it in their patients. The symptom diminishes the quality of life and prevents people from working, socializing, caring for their families, and focusing on their health and treatment. Yet, the fatigue is unpredictable, fluctuating “week to week, day to day, and even hour to hour” (Amen & Jennings, 2010).

Cassileth, Vickers and Magill (2003), Ferrer (2005) and Clark (2006) examined the effects of music listening on fatigue. Their pooled estimate indicated no
evidence of effect for music interventions. The results were inconsistent across studies. Ferrer (2005) compared live music to a no treatment control condition among cancer patients receiving chemotherapy and found that music group reported significantly less fatigue.

Hilliard (2006) evaluated the effects of music therapy on compassion fatigue and team building of professional hospice workers. Participants were seventeen nurses, social workers, and chaplains that engaged in one of two experimental music therapy groups. Results of this research indicated a significant improvement in team building in both groups but no significant differences with regard to compassion fatigue.

Burns et al. (2008) compared music with standard care in a sample of hospitalized patients receiving intensive chemotherapy and found no significant difference in fatigue between groups. Burns reported a large moderating effect of pre-intervention affect state scores on post-test scores and follow-up scores.

Previous researchers within music therapy, oncology, and nursing professions have recommended additional research demonstrating clear differences between intervention and control conditions and to examine the relationships between frequency and duration of music interventions and treatment effects (Clark, Isaacks-Downton, Wells, Redlin-Frazier, Hepworth & Chakravarthy, 2006; Mitchell, 2011; Pothoulaki et al., 2012; Chaput-McGovern & Silverman, 2012).

Ultimately, patients with cancer need additional emotional support, education, and engagement in positive strategies to increase their abilities to manage their illnesses (Robb, Burns & Carpenter, 2011). However, there is still a gap in the literature regarding if, how, and why music therapy interventions impact cancer related fatigue (Bradt, Dileo, Grocke & Magil 2011).

Therapeutic instrumental music performance as compared to the traditional occupational therapy, on endurance, self-perceived fatigue, and self-perceived exertion of 35 hospitalized patients in physical rehabilitation. The study attempted to examine whether an active musical experience such as therapeutic instrumental music performance with the musical cueing (i.e., rhythmic auditory cueing) during the
physical exercises influences one's perception of pain, fatigue, and exertion (Lim & Miller, 2011).

Anderson et al. (2012) found lower fatigue levels and higher mean energy scores for experimental participants who received music therapy services compared to control participants. Chronic fatigue is a “persistent and recurrent fatigue” what lowers an individual's quality of life. The cause and treatment of the idiopathic chronic fatigue have not been clearly established. Oriental medicine music therapy, which is one of the alternative therapies applied to many chronic diseases, is distinct from the conventional music therapies in terms of active participation and being originated from the theory of traditional oriental medicine (Ko, Lee, Kim, Lee, Ryu & Kim, 2012).

Fredenburg and Silverman (2014) measured the effects of the CBMT on the five aspects of the participant fatigue using a convergent parallel mixed-method design. The 11 participants were randomly assigned to the experimental or wait-list control conditions and completed the Multidimensional Fatigue Inventory (Smets, Garssen, Bonke & Haes, 1995) at pre-test and post-test. The quantitative results indicated that there no significant between-group differences regarding fatigue. However, the experimental participants tend to have decrease in the mean fatigue scores from pre- to posttest, whereas the control participants had increases in the mean fatigue scores from pre-test to post-test.

Another study by Rosenow and Silverman (2014) was to examine the effects of music therapy on the fatigue level of hospitalized bone marrow transplant patients. Using a randomized and controlled design, 18 participants were assigned to either the experimental group receiving music therapy or the wait-list control group. The brief fatigue inventory was used to allow patients to rate the severity of their fatigue during the study. Patients in the experimental group received music therapy sessions, incorporating patient-preferred music and verbal interaction between the music therapist and patient, for approximately 45 minutes. A significant interaction between group and fatigue was discovered; however, there were no significant main effects concerning fatigue. A slight decrease from pretest to posttest levels of fatigue was discovered upon analyses of mean fatigue data.
Music therapy and sleep quality

Sleep is intuitively and scientifically validated as a vital biological function for both physical and psychological rejuvenation and restoration in order to heal and recover from the illnesses. Human beings spend one-third of their life in essential restorative sleep to maintain mental acuity, physical, and psychological sense of wellbeing (Patel, Chipman, Carlin & Shade, 2008).

Sleep is absolutely essential for the patients to survive from the critical illness and reclaim their quality of life. Sleep problems, such as difficulty falling asleep, frequent night time wakening, waking too early in the morning, or excessive daytime sleeping, are reported by up to 72% of persons with oncology disease (Davidson, MacLean, Brundage & Schulze, 2002).

Sleep disorders may result in the fatigue, tiredness, depression and problems in daytime functioning. Several studies have focused on the effects of the music on sleep quality, and researchers have found, in a variety of study settings and populations, that music positively affects sleep. The positive effects of the music therapy on sleep quality that the earlier studies have shown and investigate the specific effects of music on sleep quality by controlling for the confounding effect of relaxation and positive expectations. It was found that usefulness of relaxing classical music as an intervention for sleeping problems in young adults (Harmat, Takacs & Bodizs, 2007).

Zimmermann et al. (1996) studied the effects of relaxing music on sleep in 96 patients who had undergone coronary artery bypass graft surgery. Levin (1998) examined the effects of ‘Brain Music’ in the treatment of 58 patients suffering from insomnia. ‘Brain Music’ is basically the transformation of spontaneous bioelectrical activity into music.

Gitangali (1998) examined a traditional Indian ragha, which is much similar to lullabies on improving sleep quality. Two studies have been conducted with children (Field, 1999; Tan, 2004). In Field’s study (1999) children in the experimental group listened to the music at naptime, while in Tan’s study (2004) they also did so at bedtime.
Three researchers have investigated the effects of music on sleep in older adults (Mornhigweg & Voigner, 1995; Johnson, 2003; Lai & Good, 2004). All studies shown that music had a statistically significant sleep-promoting effect, except for that by Gitangali (1998) in which no evidence was found for the positive effect of music on sleep.

Hernández-Ruiz (2005) explored the effect of a music therapy procedure (music listening paired with progressive muscle relaxation) on the reduction of anxiety and improvement of sleep quality in Twenty-eight abused women in shelters. He applied 20-minute recorded participant-selected music with a Progressive Muscle Relaxation script. Results indicated a significant effect on sleep quality for the experimental group, but not for the control group. In his investigation no significant relationship was found between anxiety and fatigue level and sleep quality.

The Music has been shown to be effective in a number of psychiatric conditions, including improving the quality of sleep. A pilot study was carried out to study the effects of the Indian classical music on the quality of sleep in individuals with depression. Fifty individuals diagnosed with the major depressive disorder on DSM-IV were consecutively allocated into two groups. One group received the music with selected raga, while the other group was treated with the hypnotic medications for a month (Deshmukh, Sarvaiya & Seethalakshmi, 2009).

Loewy, Stewart, Dassler, Telsey and Homel (2013) in a research evaluate the effects of music therapy on vital signs, feeding, and sleep in 272 premature infants with respiratory distress syndrome. In the results three live music interventions showed changes in heart rate interactive with time. Entrained breath sounds rendered lower heart rates after the intervention and differences in sleep patterns.

Several studies have focused on the effects of the music on sleep quality, and researchers have found, in a variety of study settings and populations, that music positively affects sleep. Finally the researcher concluded that the usefulness of soft instrumental music as an intervention for sleeping problems in breast cancer patients. Sleep disorders can result in tiredness, fatigue, depression, greater anxiety, irritability, pain sensitivity, muscle tremors, immunosuppressant, and lack of daytime alertness (Lafçi, 2015).
Hence, music is considered as a potential non-pharmacological intervention for the treatment of sleep disturbances such as insomnia. However, they were based on the self-report measures and have further limitations. For example, in most studies a control group was not used (Fried, 1990; Lai & Good, 2004).

Wang, Sun and Zang (2014) in a meta-analysis of 10 randomized studies with 557 participants resulted that the sleep quality was improved significantly by music, with significant heterogeneity across studies.

Music therapy and affect

Positive affect and negative affect constitute the emotional dimension of subjective well-being and are characterized by the frequency and intensity that subjects are prone to feel positive and negative emotions such as joy, excitement, anger, and sadness. Because positive psychology (Snyder & Lopez, 2005) has focused on understanding what makes people happier (Lyubomirsky, 2001), investigations regarding affects have been extensively conducted, and personality is suggested as an important predictor of affects (Hayes & Joseph, 2003).

High levels of negative affect are positively associated with depression, anxiety, and rumination (Trapnell & Campbell, 1999; Nolen-Hoeksema, 2000), while high levels of positive affect are positively related with job and marital satisfaction and physical health (Naragon & Watson, 2009).

Music therapy not only helps the patients cope with their negative emotions, it can also be used to benefit patients in a complex way as music is the most fundamental and unique form of art that affects people spiritually, emotionally, socially and physically (Rykow, 2008).

As there is a lack of study in effect of music therapy on affect, it can be useful to conceptualize the relationship between affect and mood as being similar to that between the weather (affect) and the season (mood). Affect refers to immediate expressions of emotion, while mood refers to emotional experience over a more prolonged period of time. Bailey (1983); Burns (2001); Barrera (2002) and Cassileth (2003) found in their separate survey music therapy are effective to improve mood in cancer patients.
Burns (2001) in a study explored the effectiveness of ten weekly music sessions in alleviating mood disturbance and improving quality of life in 8 volunteer cancer patients. The result of study shown individuals who participated in music sessions scored better on both mood scores and quality of life scores at posttest than those participating in the control group.

Waldon (2001) in an investigation examined the efficacy of a music therapy protocol on mood states and levels of group cohesiveness in adult oncology patients. Eleven oncology patients in two groups (ages 30 to 84 years) took part in his study over a ten-week period of time. Participants took part in eight music therapy sessions consisting of two types of interventions (active music therapy and receptive music therapy). Results showed significant improvement in mood state scores but no differences were found the result of two types of music therapy.

In their qualitative research, Bunt and Marston-Wyld (1995) examined the effects of the active group music therapy on oncology patients. Music therapy encouraged the patients to get into contact with feelings they had previously been unable to express.

Magee and Davidson (2002) in a pilot study surveyed the effect of music therapy on mood states in neurological patients. The results are discussed considering methodological improvements and arguing for the inclusion of music therapy as an effective intervention to address negative mood states in neuro-rehabilitation populations.

Cassileth, Vickers and Magill (2003) studied the effectiveness of music therapy for mood disturbance during hospitalization for autologous stem cell transplantation. 62 inpatients participated in this study and after intervention patients in the music therapy group scored 28% lower on the combined anxiety/depression scale and 37% lower on the total mood disturbance score compared with control group.

Guétin et al. (2008) in an observational study in patients with traumatic brain injury found positive effectiveness of music therapy on mood and reported significant improvement in mood, from the first session onwards. Daykin, McClean and Bunt
(2007) researched the effectiveness of the music therapy for oncology patients, which was part of a program of complementary and alternative medicine in supportive cancer care. 23 patients participated in the study and they were interviewed after the intervention. The results indicated that the music therapy could improve identity problems. Also, the music therapy released emotions, such as joy, power, freedom, but also negative feelings, such as loss, regret and isolation. Several qualities of music therapy were found in this research such as creativity, choice and enrichment, identity, individuality and group process.

Short, Ahern, Holdgate, Morris and Sidhu (2010) in a pilot project aimed to reduce noise stress by offering patients in the emergency department a coping strategy by headphones and music. In their randomized controlled study, 30 patients were recruited, with half undergoing the music intervention. That involved listening to music via headphones and an MP3 player from preloaded playlists in four relevant genres. Results showed a trend toward decreased negative affect scores in the intervention group. Positive affect scores remained constant or increased. Individual comments suggested participants’ enjoyment, distraction, and “escape” from the environment.

Pothoulaki et al. (2012) indicated positive effects of music therapy interventions on a range of psychological and physiological responses including reduced stress, improved mood, and enhanced overall wellbeing and positive attitudes toward life.

A research by Silverman (2014) investigated the effects of music therapy on positive and negative affect and pain in hospitalized patients recovering from a blood and marrow transplant. In this study it is examined whether receptive music therapy can improve two general dimensions of emotional experience (positive and negative affect) in a single session for hospitalized patients. He applied patient-preferred live music in receptive music therapy and there were significant between-group differences in positive and negative affect, with experimental participants having more favorable scores than control participants. From the results of this randomized effectiveness study, it seems that a single receptive music therapy session can be an effective intervention concerning positive and negative affect for hospitalized BMT patients.
Lesiuk (2015) explored the efficacy of mindfulness based music therapy to improve attention and decrease mood distress experienced by women with breast cancer receiving adjuvant chemotherapy. Repeated measures analysis of variance showed that attention improved significantly over time. Although all mood states significantly improved from the beginning to the end of each of mindfulness based music therapy session, the mood state of fatigue decreased significantly more than the other mood states.

Using music, musical programs and music therapy can improve one’s physical, mental, psychological, and social status. Music therapy method probably has psychological, psychodynamic, behavioral, and neurobiological effects, and can improve a wide range of the problems of patients. In addition, music intervention is less expensive and less risky than other methods of complementary medicine (Gutgsell, Schluchter, Margevicius, DeGolia, McLaughlin, Harris et al., 2013).

Therefore, music therapy can be an appropriate intervention for cancer patients, in which more invasive procedures would be associated with risks.

**Gap in Literature**

- There is a dearth of research on effect of music therapy in variables such as fatigue, sleep quality, and affect in cancer patients.
- There is a dearth of research on use and comparison of active and receptive music therapy along with oncology treatment.
- There is a lack of research on effect of music therapy in different types of cancer inpatients especially in the individuals in age range of 20 to 40 years.
- There is a lack of research on comparing effectiveness of active and receptive music therapy in male and female patients.

**Relevance of study**

The number of oncology patients and survivors is growing in the world. Exceptional treatments have led to a greater number of positive outcomes for oncology patients. As more people are surviving cancer, they are living with symptoms of oncology that can affect every day life, both during and after their hospitalization. Some physical and psychological symptoms of cancer or side effects
of oncology treatment, such as chemotherapy or radiation therapy, involve nausea, pain, mouth sores, loss of appetite, atypical bowel movements, fatigue, anxiety, or abnormal sleep patterns. Psychosocially, oncology diagnoses can change people’s life, prevent fulfilling life plans or daily activities, and create dependence on caretakers (Vinayak & Rani, 2010). Moreover, a cancer patient or survivor may feel a loss of control or autonomy, which may be frustrating, agitating, and stressful (Fredenburg & Silverman, 2014).

Experience of cancer generates a number of physical, emotional, social and existential needs. Stanczyk (2011) found that music is able to address many of these elements by offering a wide range of benefits. Music therapy in oncology care focuses on needs of patients, arising from the experience of disease, as well as from side effects of treatment. A wide variety of music therapy activities can take place in cancer care setting. Music therapy as a receptive and active intervention can be used to relieve stress and fear of hospitalization and the unfamiliarity of the hospital environment. Music therapy is an effective method of supporting cancer care for patients at various stages of the disease and is practiced with individual patients as well as patient groups. It can be also included for planning programs of treatment and rehabilitation to promote wellness, improve physical and emotional well-being and the quality of life.

In last decades, a growing body of evidence in the use of musical intervention in clinical setting has been seen, in terms of singing, music listening, musical improvisation, and other musical activities, as more structured music therapy treatments. Given that music engages a variety of brain areas involved in emotion, motivation, cognition, and motor functions, musical interventions have been used to increase socialization and cognitive, emotional, and neuromotor functioning (Hillecke, Nickel & Bolay, 2005; Schlaug, 2009; Koelsch, 2010; Raglio, Fazio, Imbriani & Granieri, 2013; Chanda & Levitin, 2013).

Music has been used as medicine for thousands of years. Ancient Greek philosophers believed that music could heal both the body and mind. Some people believe music therapy may be beneficial in addition to the health care of patients with cancer by promoting social interaction and co-operation (Arora, 2010). Research on
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the effects of music therapy for medical patients has burgeoned during the past 20 years and has included a variety of outcome measures in a wide range of specialty areas (Dileo, 2005).

For adults, as well as pediatric oncology patients, music has been used to decrease anxiety prior to or during surgical procedures (Pfaff, 1989; Burns, 1999; Haun, 2001), to decrease tension during chemotherapy or radiation therapy (Weber, 1996; Clark, 2006), to lessen treatment side effects (Frank, 1985; Ezzone, 1998; Bozuk, 2006), to improve mood (Bailey, 1983; Burns, 2001; Barrera, 2002; Cassileth, 2003), to enhance pain management (Beck, 1989; Akombo, 2006), to improve immune system functioning (Camprubi, 1999; Burns, 2001) and to improve quality of life (Burns, 2001; Hilliard, 2006).

Music therapy is beneficial in chronic pain management by providing sensory stimulation that evokes a response in the patient (Hilliard, 2003). There are several theories about how music therapy, positively affect perceived pain. Music serves as a distracter. Music may give the patient a sense of control. Music causes the body to release endorphin to counteract pain. Slow music relaxes a person by slowing their breathing and heart-beat (Hilliard, 2005).

Pain, fatigue, anxiety and sleep disturbance are among the most common symptoms experienced by persons with cancer (Hoffman, 2007). Pain is reported by 59% of persons receiving anticancer treatment, and 64% of those with advanced, metastatic or terminal disease (Vanden, Beuken, Everdingen, de-Rijke, Kessels et al., 2007). Fatigue is the most common symptom experienced by all the persons with cancer, impacts more than 75% of patients (Davidson, 2002). Sleep problems, such as difficulty falling asleep, frequent night-time wakening, waking too early in the morning, or excessive daytime sleeping, are reported by up to 72% of persons with cancer (Hickok, Morrow, Roscoe, Mustian & Okunieff, 2005).

The prevalence of anxiety and depression in patients with cancer has been reported to be on average 25% that can significantly affect patients’ quality of life. Ritterband and Spielberger (2001) showed that cancer patients had a lower level of positive feelings than healthy controls, while no differences were found on negative feelings.
Though the studies focused on the effect of music therapy on cancer, not much work has been done on comparing effectiveness of active and receptive music therapy in oncology patients. The present study investigated the effect of active and receptive music therapy on anxiety, pain, fatigue, sleep quality, and positive and negative affect in oncology inpatients.

**Research questions**

In view of the above-mentioned considerations, the following research questions were framed:

- Will active music therapy as compared to the pre-therapy condition be effective in the reduction of (H<sub>1</sub>) anxiety, (H<sub>2</sub>) pain, (H<sub>3</sub>) fatigue and (H<sub>4</sub>) negative affect and increase in (H<sub>5</sub>) sleep quality and (H<sub>6</sub>) positive affect in cancer inpatients?
- Will receptive music therapy as compared to the pre-therapy condition be effective in the reduction of (H<sub>7</sub>) anxiety, (H<sub>8</sub>) pain, (H<sub>9</sub>) fatigue and (H<sub>10</sub>) negative affect and increase in (H<sub>11</sub>) sleep quality and (H<sub>12</sub>) positive affect in cancer inpatients?
- Will active music therapy as compared to the no-therapy (control group) be effective in the reduction of (H<sub>13</sub>) anxiety, (H<sub>14</sub>) pain, (H<sub>15</sub>) fatigue and (H<sub>16</sub>) negative affect and increase in (H<sub>17</sub>) sleep quality and (H<sub>18</sub>) positive affect in cancer inpatients?
- Will receptive music therapy as compared to the no-therapy (control group) be effective in the reduction of (H<sub>19</sub>) anxiety, (H<sub>20</sub>) pain, (H<sub>21</sub>) fatigue and (H<sub>22</sub>) negative affect and increase in (H<sub>23</sub>) sleep quality and (H<sub>24</sub>) positive affect in cancer inpatients?
- Will cancer inpatients, receiving active music therapy show greater reduction in (H<sub>25</sub>) anxiety, (H<sub>26</sub>) pain, (H<sub>27</sub>) fatigue and (H<sub>28</sub>) negative affect and greater increase in (H<sub>29</sub>) sleep quality and (H<sub>30</sub>) positive affect than those receiving receptive music therapy and the ones in the control group?
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- Will gender differences on post-test scores emerge on (H$_{31}$) anxiety, (H$_{32}$) pain, (H$_{33}$) fatigue, (H$_{34}$) sleep quality and (H$_{35}$) positive and (H$_{36}$) negative affect in cancer inpatients?

- Will male and female cancer patients show differences in the efficacy of active and receptive music therapy in reduction of (H$_{37}$) anxiety, (H$_{38}$) pain, (H$_{39}$) fatigue and (H$_{40}$) negative affect and increase in (H$_{41}$) sleep quality and (H$_{42}$) positive affect?

Hypothesis

- Active music therapy as compared to the pre-therapy condition is effective in the reduction of (H$_{1}$) anxiety, (H$_{2}$) pain, (H$_{3}$) fatigue and (H$_{4}$) negative affect and increase in (H$_{5}$) sleep quality and (H$_{6}$) positive affect in cancer inpatients.

- Receptive music therapy as compared to the pre-therapy condition is effective in the reduction of (H$_{7}$) anxiety, (H$_{8}$) pain, (H$_{9}$) fatigue and (H$_{10}$) negative affect and increase in (H$_{11}$) sleep quality and (H$_{12}$) positive affect in cancer inpatients.

- Active music therapy as compared to the no-therapy (control group) is effective in the reduction of (H$_{13}$) anxiety, (H$_{14}$) pain, (H$_{15}$) fatigue and (H$_{16}$) negative affect and increase in (H$_{17}$) sleep quality and (H$_{18}$) positive affect in cancer inpatients.

- Receptive music therapy as compared to the no-therapy (control group) is effective in the reduction of (H$_{19}$) anxiety, (H$_{20}$) pain, (H$_{21}$) fatigue and (H$_{22}$) negative affect and increase in (H$_{23}$) sleep quality and (H$_{24}$) positive affect in cancer inpatients.

- Cancer inpatients, receiving active music therapy will show greater reduction in (H$_{25}$) anxiety, (H$_{26}$) pain, (H$_{27}$) fatigue, (H$_{28}$) negative affect and greater increase in (H$_{29}$) sleep quality and (H$_{30}$) positive affect, than those receiving receptive music therapy and the ones in the control group.

- Gender differences on post-test scores will emerge on (H$_{31}$) anxiety, (H$_{32}$) pain, (H$_{33}$) fatigue, (H$_{34}$) sleep quality and (H$_{35}$) positive and (H$_{36}$) negative affect in cancer inpatients.
• Males and females will show differences in the efficacy of active and receptive music therapy in reduction of (H37) anxiety, (H38) pain, (H39) fatigue and (H40) negative affect and increase in (H41) sleep quality and (H42) positive affect in cancer inpatients.