A Single Session Music Therapy Intervention Model for Mechanically Ventilated Patients in Intensive Care

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ABSTRACT

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Sung Tak (Josephine) Lee

Patients in the intensive care unit (ICU) are exposed to numerous stressors including environmental disturbance and extensive medical treatments. The critical state of patients' medical conditions requires close monitoring for possible rapid changes. One of the standard procedures to maintain adequate oxygen level is mechanical ventilation. This invasive treatment tremendously augments the level of state anxiety among patients. Music therapy has a long history of use in hospital settings as a complementary treatment to improve or maintain patients' well-being. Studies have shown observable benefits of music therapy in the reduction of state anxiety in patients undergoing medical treatments. However, the administration of musical experience for mechanically ventilated patients in ICU are generally done by non-music therapy staff using pre-recorded music. Publications on music therapy intervention models in the ICU remains scarce. Given the broad range of music therapy methods that can be used for this population, the purpose of this thesis is to design a single session music therapy intervention model for mechanically ventilated patients in the ICU to reduce state anxiety. The structure of this intervention model was based on the intervention research methodology outlined by Fraser and Galinsky [Research on Social Work Practice, 2010]. A systematic literature survey served as the main source of data collection and was then analysed with qualitative content analysis method through a data coding process. This research provides a framework for future music therapy clinical practices and identifies areas for further research with this population.

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Chapter 1. Introduction

The intensive care unit (ICU) is considered to be one of the most stressful places in the hospital (Chan, Chung, Chung, & Lee, 2008). The critical state of patients in the unit requires close monitoring for possible rapid deterioration of their medical condition. This inevitably increases state anxiety for everyone in the unit including patients, their family members, and staff members (Rotondi et al., 2002). Patients in ICU with respiratory failure who require the assistance of a mechanical ventilator are exposed to even more stress than other patients due to the additional suffering from this necessary but invasive procedure (American Thoracic Society [ATS], 2013; Dijkstra, Gamel, van der Bijl, Bots, & Kesecioglu, 2010). Medical music therapy has long been recognized as an effective modality in the reduction of stress and state anxiety in different medical settings (Bradt, Dileo, & Grocke, 2010; Chlan et al., 2013; Dijkstra et al., 2010; Eyre, 2008; Horne-Thompson & Grocke, 2008; Jaber et al., 2006; Lee, Chung, Chan, & Chan, 2005; Mahon & Mahon, 2011). However, the current literature on the use of music therapy in ICU contexts, which consists of the presence of a credentialed music therapist, delivering both active and receptive musical experiences to the patients, remain scarce. Given the pressing need for state anxiety management for patients who are mechanically ventilated and the broad range of music therapy interventions that can be used to improve biopsychosocial well-being in medical settings, there is a need to establish a music therapy intervention protocol for mechanically ventilated patients in the ICU. Considering the generally short length of stay and rapidly changing physical condition of patients admitted to the unit, a single session music therapy intervention design will be the most appropriate to meet the specific needs of these patients.

Relevance to Music Therapy

Music and medicine is a rapidly growing field. The benefits of music therapy as an effective and non-invasive intervention in medical settings are increasingly documented (Bradt et al., 2010; Bradt, Dileo, & Potvin, 2013; Eyre, 2008; Krout, 2001; Magee, 2005; Mahon & Mahon, 2011). However, there is a constant need to clarify different professional practices within the use of music in the hospital (Dileo, 2013). Current research on music intervention for mechanically ventilated patients focused heavily on patient-preferred music or pre-selected music administered by medical staff and largely omits music therapy sessions within a

therapeutic context (Bradt et al., 2010). Evidence has shown that music therapy sessions, which require the presence of a credentialed music therapist, can provide better assessment and meet the physical, psychological and social needs of patients (Dileo & Bradt, 2005).

As a partial requirement to fulfill her degree, the researcher had the opportunity to introduce a three-month music therapy pilot program in the ICU of a community hospital. Through this experience, the researcher noticed that such a program could be beneficial to patients as well as staff members and family members present at the time of a session. The advantage of the presence of a credentialed music therapist giving a music therapy session goes beyond providing music listening experiences alone. As positive results have been observed, it is within the researcher's responsibility as a credentialed music therapist to contribute to the growth of the profession by sharing her knowledge and experience working with this population. It is the hope of the researcher that the design of a single music therapy session protocol tailored to mechanically ventilated patients in the ICU experiencing state anxiety will provide other music therapists a framework with which to work with this population and create opportunities to test the design in clinical trials, ultimately raising awareness of the need for music therapy in the ICU.

Statement of Purpose

The purpose of this research was to design a single session music therapy intervention model that addresses the need of state anxiety reduction for patients on invasive mechanical ventilation in the intensive care unit.

Research Question

The primary research question for this research was: "What are the essential components of a single session music therapy intervention protocol for mechanically ventilated patients in an ICU who are experiencing state anxiety?"

Based on the primary question, two subsidiary questions were developed. The first question was: "What is the structure of a single music therapy session that respects the therapeutic process of assessment, intervention and evaluation?" and the second question was: "What is the most appropriate music therapy session structure for state anxiety reduction given the particular needs of mechanically ventilated patients?"

Scope and Delimitations

This research was carried out within the time limited scope of a master's degree and therefore the protocol developed through this research has not been tested at the time of the submission of this thesis. This study was delimited to include only the first step and the beginning of the second step of the five step intervention research methodology model by Fraser and Galinsky (2010). Sources of data were delimited to include accessible and relevant literature in English published after the year 2000 except two references that were dated before year 2000 for definition purposes. Sources of data also included the researcher's reflection notes through the compilation of this thesis based on her personal and professional experiences. No personal information of patients nor details of sessions were revealed. The intervention protocol was designed for mechanically ventilated adults 18 years of age or older receiving care in the ICU and suffering state anxiety. No human participants were included in this research.

Assumptions

The researcher believed that a person's well-being is influenced by the combination of biological, psychological, and social factors. Thus, state anxiety management should be considered as part of the treatment process among mechanically ventilated patients in the ICU. It was the researcher's assumption that music therapy intervention is more effective in the management of state anxiety of mechanically ventilated patients than listening to recorded music alone. She believed that careful manipulation of musical elements and knowledgeable music choices administered by a credentialed music therapist are essential to achieve better results in state anxiety reduction for ICU patients who are suffering state anxiety in comparison to music listening experiences administered by other medical professionals. The researcher assumed that the therapeutic relationship between the credentialed music therapist and the patient plays an important role in providing physical comfort, social support and emotional containment to mechanically ventilated patients experiencing state anxiety. She also assumed that music therapy has a positive impact on patients as well as their surroundings including hospital staff members and family members. Lastly, the researcher believed that a meaningful and complete therapeutic process can be achieved in a single music therapy session, as changes can be observed within this limited time frame given the rapid fluctuation of patients' condition with this particular population.

Personal Relationship with the Topic

As part of the completion of my master's degree, I introduced a pilot music therapy project to the ICU of a community general hospital as part of my music therapy advanced practicum course. At the beginning, I encountered difficulties in finding an appropriate session structure and I noticed there was a lack of available resources or literature about music therapy interventions specifically for this population. I therefore have adopted some of the music therapy session structures and interventions that I have used in my previous years of working in other hospital settings. I have also begun to explore publications available on related topics to increase my knowledge on the specific needs of this population. Although my time working in the unit was brief, I have observed that music seems to be able to provide familiarity and structure, which helps to create a secure environment for mechanically ventilated patients to express their feelings of anxiety and deal with confusion caused by this invasive treatment. In my professional experience, I have also noticed positive changes in clients' affect during sessions appears not only to be related to the music but also to the presence of the credentialed music therapist and the therapeutic relationship created through the music therapy session.

I have also had the experience of being a patient who needed mechanical ventilation while in an ICU. To reduce my state anxiety in order to rest and recover from the medical trauma, I was given heavy sedative medication. However, the extreme confusion and anxiety that I felt at the moment prohibited me to relax but instead to fight against the effects of the medication. At the time, one of my family members tried to give me music to listen to which was not to my taste. Despite the fact that this was one of the few sounds that I could make sense of, the inappropriate choice of music increased my sense of helplessness. It made me realize the power that music can have and the importance of administering it with great care and knowledge.

From my experience of working in the ICU, I typically only had one session with the patient. Although some patients unfortunately required a prolonged stay in the unit, their medical conditions fluctuated from day to day which made every music therapy session a unique therapeutic experience. This realization has motivated me to design a single music therapy session intervention as it seems more appropriate to the population of ICU patients. This single session model should respect the therapeutic process of a music therapy session and is tailored to the specific needs of mechanically ventilated patients experiencing state anxiety during their stay in unit.

Definitions of Terms

State anxiety. State anxiety refers to the current state of anxiety that a person feels at the moment (Julian, 2011). It is an existential emotion that is experienced when one is faced with uncertainty or a perceived danger such as a life-threatening illness. Some of the characteristics of experiencing state anxiety include "apprehension, unease, concern, and worry" which are "usually slow and vague, a diffuse, continuing, anticipatory state of unease" (Lazarus, 1999, p. 235).

Mechanical ventilation. In this study, mechanical ventilation refers to the invasive form of ventilation. It is a life support treatment that helps patients to breath, get oxygen into the lungs, or helps the lungs to remove carbon dioxide (Tamplin, 2013). The two forms of invasive ventilation include endotracheal intubation (EI), and tracheostomy (trach). Once connected, the ventilation machine is adjusted to provide an adequate oxygen level to the patient with close monitoring on oxygen saturation level by the medical staff (ATS, 2013; Krans, 2012; Underwood, 2012).

Single session. Each session is regarded as a self-contained unit within which to accomplish meaningful objectives. Assessment and treatment decisions are based on the here-and-now state and needs of the patient while remaining open to future treatment episodes within an ongoing therapeutic relationship (Bloom, 2001).

Medical music therapy. In this thesis, medical music therapy refers to music therapy practices administered by credentialed music therapist using specific music therapy methods within a therapeutic process, through a therapeutic relationship, with the goal to improve, restore or maintain biopsychosocial well-being of patients (Dileo, 2013).

Chapters Summary

Following this chapter of introduction, Chapter Two is the compilation of a systematic literature review on related topics areas including an overview of mechanical ventilation in intensive care, stressors in the unit and its biopsychosocial impacts, music intervention used to reduce state anxiety in the ICU, music and medicine, medical music therapy and its use in the reduction of state anxiety, and a summary of different single session intervention models in psychotherapy, social work, and music therapy in medical settings. Chapter Three outlines the intervention research methodology used for this thesis. Data collection procedures based on the

aforementioned, systematic literature survey and data analysis procedures using qualitative content analysis will be presented. Chapter Four contains the rationale for the organization of the data to construct a protocol of a single session music therapy intervention model that is suitable for clinical use. Chapter Five includes the researcher's interpretation of results, discussion of limitations and challenges of this research, as well as recommendations and suggestions for future research.

Chapter 2. Literature Review

Patients with Mechanical Ventilation in the Intensive Care Unit

The Intensive Care Unit (ICU) is a specialized unit in the hospital that treats some of the most vulnerable patients who suffer from various medical trauma. Patients' conditions could include, but are not limited to, coma, low awareness states, brain injury, organ failure, and respiratory failure (Tamplin, 2013). Staff members in this unit are specially trained to provide care to these patients who are critically ill and need constant close monitoring for possible rapid change of their medical condition. The critical state of patients admitted to the ICU often leads to acute respiratory failure, which subsequently requires the assistance of a mechanical ventilator to sustain an adequate level of oxygen in the lungs (Melanson, 2014). Causes of respiratory failure can be either an insufficient of oxygen supply (hypoxemic) or an excess of carbon dioxide in the system (hypercapnic), as described in Tamplin (2013). Mechanical ventilation is a standard procedure for patients with respiratory failure (Lee et al., 2005). Two forms of invasive mechanical ventilation procedures are commonly used to connect the mechanical ventilation machines to the lungs: endotracheal intubation (EI), and tracheostomy (trach), as described in American Thoracic Society (2013). EI is an emergency procedure where a flexible plastic tube is inserted into the windpipe (trachea) from a patient's mouth into the lungs. The tube is then connected to the ventilator machine (Underwood, 2012). While EI is often the first response to acute respiratory failure, when patients need breathing assistance for prolonged period of time, a tracheostomy will be performed. In this surgical procedure, an incision in the neck below the vocal cord will be operated to place a tube, also called the trach-tube, through the windpipe into the lungs then attached to the ventilator machine (Krans, 2012). Patients on mechanical ventilation cannot speak as the trach-tube passes between their vocal cords; they are not allowed to either eat or drink by mouth while the tube is in place (ATS, 2013). Besides the ventilation machine, mechanically ventilated patients are attached to several monitors and machines for constant monitoring to ensure adequate oxygen saturation level, heart rate, respiratory rate, and blood pressure level (Underwood, 2012).

Mechanical ventilation is a lifesaving procedure. However, due to the invasive nature of the treatment, risks and complications cannot be underestimated. Complications associated with mechanical ventilation include: buildup of excess water in tissues, bleeding, infections, lung puncture, collapsed lung (pneumothorax), damage to the thyroid gland, erosion of the trachea,

scar tissue in the trachea, and in some rare cases it may also cause death (ATS, 2013; Krans, 2012; Underwood, 2012).

State Anxiety of Mechanically Ventilated Patients in the ICU

Level of consciousness of mechanically ventilated patients. Consciousness represents a state where a person is fully alert, awake, and aware of the self and its surroundings. It is marked by the presence of arousal and awareness, where arousal is the functioning of primitive reflex response and awareness is represented by the capacity of cognitive processing and thoughts (Tamplin, 2003). Some of the medical traumas and treatments that mechanically ventilated patients in the ICU receive could result in a reduced level of consciousness during their hospital stay (Stein-Parbury & McKinley, 2000). Patients can be in different stages of diminished consciousness such as in the state of a coma, marked by the absence of both wakefulness and awareness, or in a low awareness state (LAS). LAS is composed of vegetative state (VS) and minimally conscious state (MCS; O'Kelly et al. 2013). When a patient is in VS, despite the presence of indications of wakefulness, he/she presents no perceivable evidence of consciousness, while MCS is a state where the patient shows limited consciousness. Despite limitations on communication, studies have shown that patients at different levels of consciousness maintained a certain level of awareness of their surroundings and therefore, without proper level of stimulation, could experience a great deal of emotional disturbance and an increase in state anxiety (O'Kelly et al., 2013; Stein-Parbury & McKinley, 2000; Tamplin, 2003).

Stressors in the ICU. Patients in the ICU are exposed to various kinds of stressors such as facing a life-threatening diagnosis with an uncertainty of prognosis, high noise level, constant light disturbance, an unfamiliar environment, and pain caused by illness and surgical procedures (Almerud & Petersson, 2003; Chan et al., 2008; Lee et al., 2005). Studies have shown that illness-related factors such as the nature and severity of the illness, also the kinds and amount of medication used, as well as environmental-related factors such as sleep deprivation and sensory deprivation, are common in ICU patients (Stein-Parbury & McKinley, 2000). These factors increase the risk of ICU patients developing delirium and manifesting symptoms such as confusion and hallucinations. As a result, patients become increasingly combative and anxious.

This condition is also known as ICU psychosis or ICU syndrome (Almerud & Petersson, 2003; Thomas, 2003; Welker, 2014).

Mechanically ventilated patients are more likely to experience psychological distress that generates a great sense of anxiety and fear than other patients in ICU because of the invasive nature of the procedure. Mechanically ventilated patients are often attached to multiple monitors and machines surrounding their bed which are often noisy and could lead to the feeling of being restrained. Other stressors include the inability to communicate verbally, being under the influence of heavy medication, difficulty with ventilation synchronization, as well as the pain and discomfort associated with the intervention (Davis, Gfeller, & Thaut, 2008; Melanson, 2014; Rotondi et al., 2002; Stein-Parbury & McKinley, 2000; Thomas, 2003). In a cohort study on ICU patients' recollections of stressful experiences during mechanical ventilation, out of 75 adult patients who remembered their ICU experience of being mechanically ventilated by endotracheal intubation for more than 48 hours, 44 reported remembering the feeling of anxiety as being moderately to extremely bothersome (Rotondi et al., 2002). Almerud and Petersson (2003) discussed patients' memories of their experiences while being mechanically ventilated and the following comment from a patient about feelings of anxiety and discomfort was noted: "It was unpleasant when they took away the phlegm in my throat. I had a sort of panic attack and couldn't get any air, I remember that" (p.25).

State anxiety and its impacts. Current western medicine has shifted from the traditional biomedical model, which holds the assumption that all illnesses are solely related to biological causes, towards a more biopsychosocial model, which suggests that the interaction between biological, psychological and social factors is crucial to the maintenance of health, and coping with illnesses (Davis et al., 2008). Lazarus (1999) has explained anxiety as a response to imminent danger or uncertainty that poses a threat to the loss of our ego identity, which ultimately, represents death. Psychological distress can have a great biological impact because when a stressor or an emergency situation is perceived, the sympathetic nervous system (SNS) of the autonomic nervous system becomes activated to release norepinephrine and adrenaline to prepare the body for the need for defense or to provide energy to escape, better known as the fight or flight response. The activation of the SNS will affect certain physiological responses including an increase of heart rate, respiratory rate, and blood pressure level. Ongoing stress can also result in suppressing the functioning of the body's immune system (Davis et al., 2008;

Dijkstra et al., 2010; Lee et al., 2005; Segerstrom & Miller, 2004). The considerable amount of physiological and psychological distress experienced in mechanically ventilated patients not only results in significant anxiety but will also negatively impact mechanically ventilated patients' outcomes including weaning process, time spent on the ventilation machine and in the ICU, and the chance or length of recovery (Thomas, 2003).

To manage patients' state (situational) anxiety, intravenous sedative and analgesic agents are commonly used to reduce SNS activity. However, continuous usage of such treatments often causes adverse effects, including the chance of developing ICU psychosis and prolonging patients' length of stay in the ICU. Therefore, non-pharmacological interventions are advised to provide alternative measures for anxiety reduction (Arroliga et al., 2008; Chlan, Engeland, & Savik, 2012; Welker, 2014).

Music Intervention in the Reduction of State Anxiety for Mechanically Ventilated Patients

Music has long been recognized as a non-invasive intervention to reduce state anxiety by providing distraction from pain and negative emotions. Many studies have reported the positive effects of music intervention on mechanically ventilated patients receiving care in the ICU including reduction in anxiety (Chlan et al., 2013); reduction in the need for sedative medication (Dijkstra et al., 2010); increased quality of sleep (Jaber et al., 2006); and a reduction of heart rate and respiratory rate which are indicators of relaxation (Bradt et al., 2010). Chan et al. (2008) have discussed how the entrainment of body rhythms to music stimulation can trigger the release of endorphins, a mood-altering hormone which enhances relaxation by decreasing physiological responses such as heart rate, respiratory rate, and blood pressure. Results of a randomized controlled trial done by Lee et al. (2005) indicated that mechanically ventilated patients who received a 30-minute self-selected music listening session from a pre-selected collection showed a soothing effect between pre- and post-session values on heart rate, respiratory rate, blood pressure, and C-state anxiety score. Another randomized clinical trial conducted by Chlan et al. (2013) also concluded that patient-directed music could significantly reduce levels of anxiety and sedative exposure in patients receiving care in the ICU. Nevertheless, these music interventions are most often being administered by medical professionals who are not trained music therapists and are limited to the use of pre-selected recorded music (Chlan et al., 2013; Dijkstra et al., 2010; Lee et al., 2005). In a Cochrane review conducted by Bradt et al. (2010) on music

intervention for mechanically ventilated patients that included eight studies with a total of 213 patients, only one unpublished study was conducted by a credentialed music therapist while the others were administered by medical professionals using pre-recorded music. Despite evidence of positive physiological effects indicating anxiety reduction in all the studies, a broad range of music therapy interventions that exist beyond the use of recorded music should not be overlooked. Music therapy sessions carried out by a credentialed music therapist are more beneficial, for they allow individualization of each session based on the individual needs of the patient (Bradt et al., 2010). In another study which involved mechanically ventilated patients listening to the experimenter's pre-selected music, results have shown that music that was unfamiliar or disliked by patients did not achieve the effect of state anxiety reduction (Lee et al., 2005). Therefore, the careful consideration of music choices and manipulation of musical elements that necessitate the presence of a credentialed music therapist should not be neglected in order to reach the desired goal of state anxiety reduction and to ensure best practice for patients.

Music and Medicine

There is a constant need to distinguish all practices utilizing music in medical settings from those of medical music therapy practices. Dileo (2013) discussed the growing, applied field of music and medicine, which she defined as the use of music intervention in different medical settings to achieve or promote health and well-being. She divided the practices of music and medicine into four categories which included: (1) Treatment of musicians; (2) Music in medical and health education; (3) Music practices for medical patients and staff; and (4) Foundational research (p.111). Within the category "music practices for medical patients and staff" (p.113), the distinction has been made to differentiate practices of music by medical staff and by credentialed music therapists. Music medicine or music in medicine refers to "the use of music by medical personnel to reduce anxiety, pain, and autonomic reactivity and improve the status and well-being of medical patients" (p.113). This includes the administration of pre-recorded music for patients by medical staff. The practice of music therapy in medical setting (or medical music therapy) is based on the working definition proposed by Bruscia (1998), that "music therapy is a systematic process of intervention wherein the therapist helps the client to promote health, using music experiences and the relationships that develop through them as dynamic

forces of change" (p.20). Medical music therapy therefore necessitates the presence of a credentialed music therapist and should include the following elements: "(1) Use of a therapeutic process of assessment, treatment, and evaluation; (2) Range of musical experiences offered to the patient; and (3) Relationship with the patient that evolves through the music" (p.114). Music therapy intervention should offer a range of musical experiences to patients within the process of assessment, treatment, and evaluation through the therapeutic relationship established between the therapist, the patient, and the music (Dileo, 2013).

Medical Music Therapy

Medical music therapy research. Medical music therapy uses a wide array of music therapy interventions by a credentialed music therapist with different medical populations of all ages to respond to their specific needs. In a meta-analysis done by Dileo and Bradt (2005), a total number of 183 research studies within the years of 1963-2003 were reviewed. They categorized and compared studies under "music medicine," which involves passive music listening of pre-recorded music selections administered mostly by non-music therapy medical professionals focusing on the effect of music itself; and "music therapy" studies, which includes the presence of a credentialed music therapist to offer intervention within the scope of music therapy methods, with a focus on the therapeutic process between the therapist-client relationship. The results have indicated that the number of studies in music medicine were much more than those of music therapy. Dileo and Bradt (2005) made the assumption that this phenomenon could be due to the fact that most music therapy methods are clinical and therefore difficult to standardize into experimental trials. Nevertheless, the authors emphasized the need for more research on medical music therapy as a future research recommendation. Their first recommendation stated that future music therapy researchers should "clearly distinguish music therapy from music medicine in research endeavors and to increase the amount of music therapy research within all medical specializations" (p.77). They also specified the need to focus on the influence of the relationship between the therapist and the client, the music and the therapeutic process, and the effectiveness of a wide range of music therapy approaches in both active and receptive methods (Dileo & Bradt, 2005).

Medical music therapy practices. Despite the limited number of research publications in the field of medical music therapy, the practice of music therapy in medical settings has

gained more recognition over the years with an increasing number of c00redentialed music therapists working with a wide range of clinical populations and sharing their knowledge through articles published in different reputable journals. In the year 2012 alone, 66 articles from English-language journals about music therapy work with clinical populations were published addressing the vast variety of clinical needs of children, adolescents, adults, and older adults (Gallagher, Mullan, & Tolman, 2014). Music therapy has been used as an intervention tool in many hospital settings in partnership with a multi-disciplinary team to contribute to the well-being of patients. Publications on the work of credentialed music therapists in hospital settings include but are not limited to oncology (Mahon & Mahon, 2011); palliative care (Horne-Thompson & Grocke, 2008); hemodialysis (Eyre, 2008); cardiology (Bradt, Dileo, & Potvin, 2013); patients in low awareness states (Magee, 2005); and post-surgery (Rosenow & Silverman, 2014). During music therapy sessions, both live active music therapy interventions (e.g., singing, song writing, song and music choice, lyric discussion, and instrumental or vocal improvisation) and live receptive music therapy interventions (e.g., music-assisted relaxation, song or music listening) can be used to provide sensory stimulation and encourage engagement of patients based on the goal(s) and objectives of the session established through careful assessment of needs and constant observation for on-going changes throughout the session. Some of the common goal(s) and objectives in a music therapy session in medical settings include: reduction of anxiety, stress management, alteration of mood, alleviation of pain, encouragement of emotional expression, improving relaxation, increasing socialization, and promoting overall wellness (Dileo & Bradt, 2005; Eyre, 2008; Mahon & Mahon, 2011).

Medical music therapy in the reduction of state anxiety. Reduction of anxiety and stress management are some of the primary goals of music therapy sessions performed to respond to the here-and-now needs of hospitalized patients. Rosenow and Silverman (2014) conducted a clinical trial to study the immediate effects of a single session music therapy on the level of post bone marrow transplant patients' perceived anxiety and concluded that "immediate and significant improvements in fatigue, anxiety, and relaxation form pre to post-test [were observed]" (p.68). Patients in the experimental group were given 30-45 minutes patient-preferred live music based on the iso-principle method. The iso-principle is a systematic approach first introduced in the late 40's by Dr. Ira M. Altshuler who used music within psychiatric treatment to achieve better mood management of his patients (Heiderscheit & Madson, 2015). Altshuler

suggested that music can lead to physiological and emotional changes by first matching the patient's current state and mood and then moving "to a more desirable state by altering the musical components of rhythm, tempo, dynamics and melody" (Davis, 2003, p.251). Rosenow and Silverman (2014) further explained that the music selection process with the iso-principle method to achieve anxiety reduction should occur throughout the session. Choice of an appropriate musical style that corresponds to the current state of the patient should occur with continuous observation and discussion with the patient.

Davis et al. (2008) discussed how music therapy interventions such as music listening and music engaging experiences can address biopsychosocial needs of hospitalized individuals in both chronic and acute care. The psychosocial need of normalization in dealing with negative emotion fostered by environmental and psychological stressors in hospital settings can be met through music therapy interventions. Normalization is defined as a "process of integrating objects, events, and interactions that resemble everyday life (normal) into the medical environment" (p.326). Active music therapy interventions such as singing along and musical improvisation that encourage social interaction between the therapist and the patient, or the patient with her/his family members, can achieve state anxiety reduction. Through meaningful musical activities, feelings of anxiety brought about by being in the ICU have been normalized into "social opportunities and meaningful leisure activities adapted to fit the individual's level of functioning" (p. 329).

Normalization is achieved with the therapeutic relationship established between the patient and the music therapist through therapeutic musical experiences. Eyre (2008) and Mahon & Mahon (2011) also discussed utilizing live active and receptive music therapy interventions to help reduce state anxiety experiencing in patients going through hemodialysis and cancer treatments. Emphasis was given to the importance of the presence of a credentialed music therapist to provide live music intervention to better assess the needs of the patients, determine objectives and goals, and follow up with adequate evaluation to ensure the quality of the service offered.

In spite of the common practice of administering pre-recorded music to mechanically ventilated patients, the advantages of using live music with the presence of a credentialed music therapist were discussed numerous times in the literature. Rosenow and Silverman (2014) argued that "the use of live music allows the music therapist to observe fluctuations between calm and

anxious behaviors and enables the therapist to reflect those changes through the music" (p.66). The presence of a credentialed music therapist also allows the establishment of rapport with the patients and their family members to facilitate interaction and contain expression of feelings, as well as to provide an opportunity for reminiscence and life review (Krout, 2001).

The benefits of music therapy on the reduction of state anxiety were also observed in patients in diminished states of consciousness. Musical elements such as melody, dynamic, pitch, tempo, and musical flow represent primitive forms of communication before the establishment of language, which could serve as a connection tool for patients whose responsiveness is limited (Magee, 2005). However, the understanding of patients' diagnosis and careful manipulation of musical elements by a credentialed music therapist is necessary to provide an adequate level of stimulation to patients in order to avoid under-stimulation in patients who are sensory deprived or over-stimulation in exhausted patients who need relaxation (Tamplin, 2003).

Although medical music therapy has shown evidence of its beneficial effects on the reduction of state anxiety, research on music therapy intervention for mechanically ventilated patients in the ICU remains scant. At the conclusion of their Cochrane review on music intervention for mechanically ventilated patients, Bradt, Dileo and Grocke (2010) suggested that there is a need to develop new music therapy intervention protocols for mechanically ventilated patients to better address patients' individual needs, and to provide a platform for future clinical trials on this population where results can be tested and documented.

Single Session Intervention

To establish a music therapy intervention protocol for mechanically ventilated patients in the ICU, many factors need to be considered. As Bruscia (1998) explained, music therapy is a process of change over time in the relationships between the therapist, the client, and the music. However, patients transferred to the ICU are critically ill and require close monitoring for their medical condition that can change from minute to minute (Davis et al., 2008). According to a community general hospital in Montreal, their ICU has treated over 1,000 patients with severe, life-threatening conditions per year and the average length of stay in the unit is about three days (Jewish General Hospital, 2014). The short length of stay and possible rapid change of medical conditions of patients in ICU suggest that the establishment of a protocol for a single session

music therapy intervention will be more appropriate to meet the needs of patients of this population according to the reality of the unit.

Medical music therapy model. Publications on the use of single session in medical music therapy are limited but can be found in palliative care (Krout, 2001), post-surgical care (Chaput-McGovern & Silverman, 2012; Rosenow & Silverman, 2014), and psychiatry (Silverman, 2011).

Krout (2001) conducted a quasi-experimental trial on 80 patients who were given the diagnosis of a terminal illness with a life expectancy of less than six months. His results showed that single session music therapy intervention with both active and receptive techniques could significantly increase patients' pain control, physical comfort, and relaxation, based on both observed and self-reported pre-session to post-session results. Similar conclusions were also suggested by Chaput-McGovern and Silverman (2012) in their pilot study administering a single session music therapy intervention in a post-surgical oncology unit of a hospital. Results revealed that approximately 20 minutes of a single session music therapy intervention showed immediate positive effects on "relaxation, anxiety, pain, nausea, and perception of music therapy" (p.419) and the effects were sustained in a follow-up that occurred 30-45 minutes later. Another research study conducted with 50 patients receiving a single session patient-preferred live music intervention after a bone-marrow transplant also showed immediate and significant improvement in fatigue, anxiety, and relaxation ($p < 0.001$) (Rosenow & Silverman, 2014).

In all experimental trials discussed above, Likert-Type Scales were used in pre-test and post-test to obtain state anxiety level of patients. In two of the studies, music therapy sessions were offered as a post-surgery service and consisted of a brief patient-preferred live music intervention (Chaput-McGovern & Silverman, 2012; Rosenow & Silverman, 2014). Despite the positive results found in the single session music therapy in medical settings, these studies have not disclosed in detail about the structure of the treatment process. To obtain such information, single session models used in other related fields are considered.

Psychotherapy and social work model. Single session intervention models have been established in the fields of psychotherapy and social work services over the last decades. Its growth in number is closely related to the increasing demands for mental and social services in society and the continually decreasing access to available resources in health care systems (Cameron, 2007). More research has since been conducted to explore the procedures and benefits

of single session therapy. Despite brief encounters, studies have shown positive impacts and usefulness of these sessions in different hospital settings (Bloom, 2001; Cameron, 2007; Dziegieleski, 2008; Gibbons & Plath, 2012).

Single session psychotherapy derives from a larger field of short-term psychotherapy in which short-term interventions, with careful planning and execution have been shown to be as effective as the traditional time-unlimited psychotherapy (Bloom, 2001). Short-term psychotherapy sessions are designed to be intermittent, which offer an ongoing therapeutic relationship with multiple brief treatment episodes. Each session is seen as a self-contained unit and the therapist will take on a more active and directive role in establishing goals and objectives addressing the most salient issue at the moment of a session. The protocol of such intervention is intended to offer help to the client whenever they are in need and seek help from the therapist or when they are in a crisis situation. The elapsed time in between two sessions is not predetermined but is considered as part of the therapeutic process. Time in between each clinical encounter is considered to have significant therapeutic benefits which contribute to the change in the client (Bloom, 2001). Single session psychotherapy shares a common epistemology with short-term psychotherapy. In a single session psychotherapy, the therapist adopts a leading role to help the client to identify the present problem, then to explore existing resources and potential solutions (Cameron, 2007). The goal of single session psychotherapy is "to establish and achieve its objectives within that session while at the same time welcoming the client to return for additional brief episodes of treatment as needed" (Bloom, 2001, p.76).

Dziegielewski (2008) discussed short-term therapy intervention in a social work context. Social workers are required to take a more active role in defining goals of the session mutually with the client and execute a goal-oriented session to address the problem identified in a focused and effective manner. The development of short-term therapy intervention is related to the huge workload of social workers employed by hospitals which often allow only one encounter with their patients and therefore a single session intervention model became a necessity. Gibbons and Plath (2012) have defined single session intervention in medical settings as a one-off, face-to-face contact with a patient within a day. They proposed a model of single session intervention to achieve satisfactory results on a single contact for patients who often are in crisis situation. The eight steps of single session intervention model are summarized in the following: (1) Attend to the client's immediate situation; (2) Provide information about the service; (3) Assess and

identify the central issue; (4) Identify clear parameters and realistic goals; (5) Advocate for client and negotiate with her/his social systems; (6) Provide practical assistance; (7) Provide information for the future and access to follow-ups, and (8) Closure with review of goals and resources (p. 45).

Evidence has shown that state anxiety is a noticeable problem that needs to be addressed in mechanically ventilated patients receiving care in the ICU. Although research on medical music therapy intervention in the ICU remains scant, medical music therapy is an evidence-based practice that has demonstrated positive outcomes in the reduction of state anxiety in multiple medical settings. The single session therapy model is also a well-studied model that has been used in multiple settings where a multiple-sessions therapeutic procedure is not possible, and has proven its effectiveness. Given the specific environment of the ICU, a single session intervention model seems to be more appropriate than the conventional multiple-sessions intervention model. These findings have supported the possibility of establishing a single session music therapy intervention model designed for mechanically ventilated patients in ICU to decrease their state anxiety, and which can serve as a framework for future research.

Chapter 3. Methodology

Research Design

The design of this intervention research was based on the five-step intervention research model design of Fraser and Galinsky (2010). The five steps of this model are: (1) Develop problem and program theories; (2) Specify program structures and processes; (3) Refine and confirm in efficacy tests; (4) Test effectiveness in practice settings; and (5) Disseminate program findings and materials. Fraser and Galinsky (2010) defined intervention research as a "systematic study of purposive change strategies" which is "characterized by both the design and development of interventions" (p. 459). The aim of this intervention research model development was to contribute to new design of programs in social services. As stated in Chapter 1, given the limitation of time and resources of this research, only the first step and the beginning of the second step of this methodology were covered.

The first step of the five-step model was to "develop problem and program theories" (Fraser & Galinsky, 2010, p.463) related to mechanically ventilated patients in the ICU. The purpose of this research was to develop an intervention with a focus on reducing state anxiety of patients on mechanical ventilation in ICU. Therefore, "risk, promotive and protective factors" (p.463) that related to the experience of state anxiety of patients receiving mechanical ventilation were first discussed to develop the problem theory. Malleable mediators related to the reduction of state anxiety of mechanically ventilated patients were then identified to develop a program theory for the development of an intervention model. This was followed by an overview of the ICU setting and different kinds of music therapy interventions and methods to define key features that helped to determine appropriate "intervention level, setting and agent(s)" of the intervention model in order to propose a "theory of change and logic model" (p.463).

The second step of the five-step model was to "specify program structures and processes" (Fraser & Galinsky, 2010, p.463) that were dedicated to the design of the single session music therapy intervention model. Based on information gathered in the previous step, goals and objectives were identified according to the problem and program theory discussed at the first step. The structure of the single session music therapy intervention model was then developed to address recruitment procedure, assessment, intervention, and evaluation process within the session to specify "essential program elements" (p.464).

Data Collection Procedures

Data collection was based on the systematic review of the current literature published after year 2000 with the exception of two references for definition of terms purposes. Data on related topics were collected separately and in conjunction including music intervention, medical music therapy intervention, single session intervention, state anxiety, mechanical ventilation, and the ICU. These topics were searched under the fields of music and medicine, music therapy, music in medicine, medicine, psychotherapy, and social work. Literature sources were obtained through: books accessible within Concordia University library and through COLOMBO interlibrary loan; multiple databases such as PsycINFO, MEDLINE, Google Scholar; and several music therapy, medical, and nursing journals. Thesis and doctoral dissertations obtained from Spectrum and ProQuest on related topic and music therapy research conducted with the same methodology were also consulted.

Data collected was categorized topically according to the structure organized in the compilation of the literature review. The categories included (a) patients with mechanical ventilation in the ICU; (b) state anxiety of mechanically ventilated patients in the ICU which was subdivided into three sections: level of consciousness of mechanically ventilated patients, stressors in the ICU, and state anxiety and its impacts; (c) music intervention in the reduction of state anxiety for mechanically ventilated patients; (d) music and medicine; (e) medical music therapy which was subdivided into three sections: research, practices, and medical music therapy in the reduction of state anxiety; (f) single session intervention which was subdivided into two sections: medical music therapy model and psychotherapy and social work model. The researcher's personal reflection on topic areas throughout the data collection and data analysis process based on her knowledge and both professional and personal experiences were kept as memo notes and considered as part of the data collection to be incorporated into data analysis procedure. The reason for this inclusion was because of the lack of available resources specifically on interactive music therapy intervention with the ICU population. These notes were the researcher's thoughts in response to data collected and did not contain any confidential information about patients nor discussion of any particular session occurring within the researcher's clinical experience.

Materials

Data from the literature was collected in printed papers and stored in a binder. Scanned copies were kept in the researcher's personal computer and backed up on a USB flash drive. Research data and references were organized in a personal account in Mendeley.

Data Analysis Procedures

The first and second steps of the five-step intervention model by Fraser and Galinsky (2010) were used to complete the data analysis procedure. The first step was to develop problem and program theories, specifically to identify problem theory of risk factors and malleable factors of the program theory. To carry out this step, a thorough qualitative content analysis was employed to examine all articles collected for the compilation of the literature review to identify qualitative data related to risk, promotive, and protective factors of patients experiencing state anxiety in the ICU, and malleable factors that were discussed in the data collection concerning the needs of mechanically ventilated patients receiving care in the ICU. The findings were then categorized into open, axial, and selective coding to develop problem and program theory (Hesse-Biber & Leavy, 2011; Hsieh & Shannon, 2005). Open coding was first assigned to identify texts that contained data pertaining to "problem theory of risk, promotive, and protective factors", and "program theory of malleable mediators" related to the experience of state anxiety among mechanically ventilated patients in the ICU (Fraser & Galinsky, 2010, p.463). Patterns and themes in the open coding were then reanalyzed and classified into axial coding to identify specific risk factors and malleable mediators. The axial coding was then grouped into selective coding that corresponded into problem theories of risk factors and malleable factors of the program theories (Marshall & Rossman, 2011).

To determine accurate themes in axial and selective coding, the primary and subsidiary research questions were revisited to ensure all themes determined were focused on key features that informed the answer of the research questions and were relevant to the construction of a single-session music therapy intervention protocol. To answer the research questions, eight axial coding themes were selected and categorized under the two selective coding themes, two under the theme of risk factors and six under the theme of malleable factors which was then divided into two sub-categories.

In parallel to the analysis of data collected from articles of the literature review, during the process the researcher kept memo notes on topic areas. These notes were comprised of thoughts and reflections throughout the process of the compilation of this research paper, based on the researcher's knowledge, clinical experience in medical music therapy, and experience with the ICU including working in the unit as a credentialed music therapist and also personal experience of being a mechanically ventilated patient receiving care in the unit. These notes were collected as an additional data for the compilation of the next step of the intervention model.

The second step of Fraser and Galinsky's (2010) five-step intervention research model is to "specify program structures and processes" (p.463). Only the design of the single session music therapy intervention protocol was implemented in this research with a brief discussion of essential program elements. Based on the findings on problem and program theories done in step one, the researcher created a four-phase protocol structure of a single session music therapy intervention for mechanically ventilated patients in the ICU which focused on the reduction of state anxiety.

In the process of compiling of the protocol, data from the researcher's memo notes were reviewed and incorporated into the structure. This step was necessary as an addition to the formulation of the four-phase protocol due to the lack of available resources on music therapy intervention in intensive care units with adult populations. In this way, the clinical and personal experience of the researcher were considered as a supplementary resource to the construction of the intervention research protocol.

Chapter 4. Results

Step One: Develop Problem and Program Theories.

Identification of the problem. The review of the literature revealed two themes relating to the identification of risk factors. They included the identification of medical conditions of patients and the identification of causes and effects of state anxiety.

Identification of medical conditions of patients. Patients in the ICU who required the assistance of mechanical ventilation suffered from respiratory failure which is often secondary to other severe medical conditions. Mechanical ventilation is an invasive form of treatment, a tube is placed in the patient's lungs through the nose, the mouth or the trachea and attached to the mechanical ventilation machine. Heavy doses of medications are often administered to mechanically ventilated patients for their complicated medical conditions and to manage discomfort. While on the machine, patients are not able to speak, eat, or drink, and they are attached to several medical devices for constant monitoring due to the possibility of rapid change in their health conditions.

Identification of causes and effects of state anxiety. Mechanically ventilated patients in the ICU are exposed to multiple stressors during their course of stay. Many of these stressors are inevitable since they are by-products of this life-saving procedure. However, the combination of numerous factors including environmental, physical, and psychosocial factors contributes to the increase of state anxiety among mechanically ventilated patients in the ICU. The accumulation of stressors that augment the level of state anxiety are known to have a negative impact on the overall well-being and recovery outcome among patients. Therefore, state anxiety reduction is one of the major issues that need to be addressed with mechanically ventilated patients in the ICU. The use of conventional methods of intravenous sedative and analgesic agents to inhibit SNS activity proves to have adverse effects on patients. Consequently, the development of non-pharmacological and non-invasive intervention methods become necessary to help reduce state anxiety with this population. Although patient-preferred music listening interventions have been used in some ICU settings with positive results in physiological changes, the benefits of the wide spectrum of music therapy intervention, which focuses on a therapeutic process and the establishment of therapeutic relationship, should be encouraged.

Program theories. A review of the literature confirmed that music therapy is an effective method to reduce state anxiety in medical settings. It is also a non-pharmacological and non-

invasive intervention that could respond to the biopsychosocial needs of state anxiety reduction among mechanically ventilated patients in the ICU. However, with the possibility of rapid change of physical condition among mechanically ventilated patients, the conventional music therapy intervention structure involving a progress of multiple lengthy sessions is not suitable for this population. To respond to the specific needs of mechanically ventilated patients in the ICU, the music therapy intervention protocol designed for this research should be a single-session structure with music therapy intervention methods that focus on the reduction of state anxiety which are feasible in the setting of an ICU.

Malleable mediators. To develop a proper program theory for mechanically ventilated patients which focuses on state anxiety reduction, six malleable mediators were identified through a data analysis procedure that fall within two overarching categories of physical comfort and psychosocial support.

Physical comfort. Mechanical ventilation is an invasive procedure which involves the insertion of a plastic tube into the lungs of patients. This operation generates considerable physical stress due to the inability to eat or drink, and feelings of discomfort and pain. Some patients who maintain a certain level of breathing capacity can have trouble establishing breathing synchronization with the machine which may cause more anxiety because of the feeling of choking. Studies have shown that when exposed to stress, a person's SNS will be activated to prepare the body for a fight or flight response. For patients in a vulnerable state, the continuous activation of the SNS results in an overwhelming physiological impact including an increase in vital signs and decrease in the functioning of the body's immune system. To enhance physical comfort, three malleable factors have been identified: alleviate pain perception, promote relaxation, and deactivation of SNS.

Psychosocial support. Patients being treated in the ICU are exposed to an unfamiliar environment with minimal privacy. Constant disturbance of noise and light can lead to sleep deprivation. Patients may feel confined to the bed or to the limited space of the room and feel further confined as they are attached to monitors and machines. The lack of positive sensory stimulation and the inability to communicate verbally about their feelings and their needs may cause social deprivation among patients on mechanical ventilation. The uncertainty of prognosis and threat of death also cause an enormous emotional and psychological burden. Psychosocial distress may also be caused by heavy medication in which patients may exhibit signs of ICU

syndrome, such as being confused and agitated. To provide psychological support, three malleable factors have been identified: mood management, social interaction and emotional expression.

Summary

The following six malleable mediators that have the potential to enhance physical comfort and provide psychosocial support crucial in the reduction of state anxiety in mechanically ventilated patients in the ICU were determined:

Physical comfort

1. Alleviate pain perception
2. Deactivation of sympathetic nervous system
3. Promote relaxation

Psychosocial support

4. Mood management
5. Social interaction
6. Emotional expression

Action Strategies. The action strategies are based on individual sessions that will take place in patients' room with optional involvement of family members and/or staff members when the opportunity arises. Session goal(s) and objectives will focus on the most salient need of the patient at the moment when the session takes place. Different musical experiences, including active and receptive music therapy interventions, will be considered with their specific uses outlined below.

Active and receptive music therapy intervention. Active music therapy interventions include all intervention methods that encourage the active engagement of patients. One of the purposes of using active music therapy interventions is to provide stimulation through musical interactions and patients' engagements to achieve a range of biopsychosocial goals (Eyre, 2008). Conversely, receptive music therapy interventions include all intervention methods in which patients take on a less active role in the involvement of music-making but instead, adopt a more receptive role to receive musical stimulation. Some of the main goals of using receptive music therapy interventions are to match the capacity of the level of engagement of the patient, to encourage relaxation, and to provide comfort (Eyre, 2008). For patients in a coma or low

awareness state, receptive music therapy method will serve as an effective way to meet the needs of auditory stimulation of these patients. Despite the inability to respond, physiological changes can be observed with the presence of musical stimulation and become a form of communication between the credentialed music therapist and the patient.

When designing music therapy interventions for mechanically ventilated patients, it is essential to consider that the capacity of verbal communication in this population is limited or impossible. Therefore, creative ways of establishing contact such as asking questions requiring only *yes* or *no* answers, creating simple communication cards with single word or song titles which patients can point at, or encouraging patients to express through the playing of an instrument are some of the ways to facilitate communication and equip patients with tools of non-verbal expression.

Active and receptive music therapy interventions are tools that credentialed music therapists can employ in response to the needs of state anxiety reduction in mechanically ventilated patients which are identified as malleable factors. Action strategies pertain to each of the malleable factors are discussed below.

Alleviate pain perception. Although music therapy intervention cannot completely replace the need for analgesic medication, it has shown promising results in the reduction of pain medication intake, eased anxiety and improved patients' satisfaction (Krout, 2001; Mahon & Mahon, 2011; Rosenow & Silverman, 2014). Active music therapy interventions such as selecting preferred songs with the credentialed music therapist, lyric discussion, and playing percussion or tapping to the beat of live music can provide stimulation to patients that helps with re-focusing and distraction from the perception of pain. If a patient cannot participate actively, receptive music therapy interventions such as listening to live performance of music or songs of the patient's preference will help promote relaxation response and divert her/his attention from pain perception.

Deactivation of sympathetic nervous system and promote relaxation. Anxiety can trigger the activation of the SNS marked by the increase of heart rate, respiratory rate, and blood pressure level. Continuous activation of SNS can cause significant psychological and biological impact for the patients. Entrainment or synchronization of body rhythms were discussed in some articles where music is used as the rhythmic medium to facilitate the synchronization of patient's heart rate or breathing rate in order to influence the limbic system and trigger the release of

endorphins, to reduce physiological response and achieve relaxation (Chan et al., 2008). Receptive music therapy interventions such as: listening to preselected songs or music with simple repetitive rhythms; predictable dynamic; walking tempo; consonance of harmony; and soft timbre would facilitate the achievement of relaxation. Live music performed by a music therapist is preferred to match the changes of physiological response of patients during the session.

Mood management. Mechanically ventilated patients in the ICU often experience mood fluctuation during different periods in the day due to the effect of medication and the discomfort and restriction associated with the invasive intervention. To effectuate mood alteration during the music therapy session, methods based on the iso-principle could be considered. The credentialed music therapist will match the mood of the patient in the here-and-now through active and/or receptive music interventions such as musical improvisation, song choosing, and singing songs to the patient, then gradually encourage the patient to move into a more positive mood state through a change of interpretation of musical elements, lyrics discussion, and song choices.

Social interaction. The experience of hospitalization in the ICU while being mechanically ventilated can be intense and overwhelming for both patients and their family members. The presence of the credentialed music therapist, therefore, is important to provide support and encourage positive social interaction between patients and their family members. Normalization is one of the techniques that emerges from the literature, where the goal of the music therapy session is to provide meaningful experiences for patients to normalize the negative emotions generated by the hospitalization experience. Although unable to communicate verbally, musical activities that require participation of patients and/or family members can serve as the medium of communication. Active music therapy interventions such as song composition dedicated to the patient or a family member; lyric discussion; and musical improvisation, as well as receptive music therapy interventions such as singing meaningful songs chosen by family members to the patient would enhance social interaction for both patients and family members.

Emotional expression. During hospitalization, patients often feel their voices are not being heard and their emotional needs are not being properly addressed. This is especially true for mechanically ventilated patients who are restrained in their verbal communication and movement. In a stressful unit, staff members might not be able to provide enough time to fully attend to each patient's feelings and emotional needs. In such cases, music therapist plays an

important role in supporting patients' psychological needs by encouraging emotional expression through music therapy interventions. Active music therapy interventions such as inviting patients to play instruments along with live music, including musical improvisation, can help externalize emotions and provide an outlet for patients to express their feelings.

Step Two: Program Structures and Processes

Goals and objectives. The main goal for this intervention research is to reduce state anxiety of patients on mechanical ventilation in the ICU. The literature revealed that anxiety is an existential emotion that emerges when an individual perceives life-threatening circumstances. State anxiety experienced in mechanically ventilated patients in the ICU is a result of the combination of multiple biopsychosocial factors such as the presence of pain and discomfort, deprivation of social interaction, and mood fluctuations related to changes in physical condition. In step one of this intervention research, six malleable mediators have been identified according to the literature review that have the potential to enhance physical comfort and provide psychosocial support that are essential in the reduction of state anxiety (see p.25). These malleable mediators represent the goals of the single-session music therapy intervention model of this research which focuses on the reduction of state anxiety of mechanically ventilated patients in the ICU. Table 1 below (p.29) illustrates each goal with their specific objectives achievable through different active and/or receptive music therapy interventions.

Table 1.

Goals and Objectives of Single Session Music Therapy Intervention for Mechanically Ventilated Patients in ICU

Physical Comfort
Goal 1: Alleviate perception of pain
Objective 1.1: Patient will participate in session through being actively involved in music making
Objective 1.2: Patient will listen to songs or music pieces of her/his choice
Goal 2: Deactivation of sympathetic nervous system
Objective 2.1: Patient will play percussion instrument with music led by the music therapist in a tempo that matches her/his heart rate then gradually, the music therapist will adjust the tempo of the music to an optimum heart rate level
Objective 2.2: Patient will listen to live music performed by the music therapist in a tempo that matches her/his heart rate then gradually, the music therapist will adjust the tempo of the music to an optimum heart rate level
Goal 3: Promote relaxation
Objective 3.1: Patient will participate in a music and imagery experience that promotes images related to feelings of relaxation
Objective 3.2: Patient will listen to songs or music pieces with tempo matching the ventilator machine rate to help synchronize her/his breathing
Psychosocial Support
Goal 4: Mood management
Objective 4.1: Patient will choose songs that represent her/his mood at the moment
Objective 4.2: Patient will process her/his current mood through simple lyric discussion and suggest song choices to achieve a more desirable mood
Goal 5: Social interaction
Objective 5.1: Patient will participate in the planning of the session by choosing musical experience(s) that will make her/his session meaningful
Objective 5.2: If appropriate or relevant, patient's family member(s) will be encouraged to participate in choosing songs or music pieces for the patient
Objective 5.3: Patient will dedicate songs or music pieces to her/his family member(s) or staff member(s) as a way of communication
Goal 6: Emotional expression
Objective 6.1: Patient will participate in song composition, music selection, and/or musical improvisation expressing thoughts and feelings
Objective 6.2: Patient will choose songs or music pieces that are meaningful to her/him
Objective 6.3: Patient will listen to music played by the music therapist that reflects her/his actual emotional state

Four-phase program structure. In a fast-paced hospital unit such as the ICU, numerous patients are being admitted to the unit while others are discharged on a daily basis. Therefore, an easy-to-follow, structured and yet flexible music therapy program protocol is essential for the music therapist providing service in the ICU in order to make decisions that best suit the patient's needs in the moment. Research in the literature indicated that an average duration of a music session in the ICU should not exceed 30 to 45 minutes, which corresponds to the concentration and energy span of this population. To facilitate a single-session music therapy experience with care, a four-phase program structure protocol is designed.

The four-phase protocol is comprised of:

1. Recruitment phase: the process of creating means to inform team members, family members and patients about the program and the establishment of a referral system to facilitate communication between team members and the credentialed music therapist.
2. Assessment phase: the process of gathering essential information on the patient's health condition, needs, and current level of state anxiety. In order to accurately assess patients, tools and methods to assess the patient's level of consciousness, level of anxiety, and musical preferences will be discussed. These assessments will allow the credentialed music therapist to evaluate the patient's most salient needs at the moment of the session to determine the most appropriate goal(s) and objectives of the session.
3. Intervention phase: findings on the assessment phase will inform the session plan and session flow. The credentialed music therapist will decide on the music therapy interventions used to achieve goal(s) and objectives. This will be followed by the actual execution of the music therapy session through active and receptive music therapy interventions.
4. Evaluation phase: evaluation will be performed after each single session. Goal(s) and objectives of the session will be reviewed to determine if those are met through the session. The music therapist will evaluate the effectiveness of interventions used in the session in the reduction of state anxiety of the patient. Changes that occur within the session will be reported in the patient's medical chart. The credentialed music therapist will also take time for personal reflection on the single-session program

structure in order to determine necessary adjustments for future sessions to ensure a quality practice at all times.

Phase one: recruitment. Patient turn around rate is high in the ICU. Credentialed music therapists working in the unit may encounter different patients every time they are in the unit. Therefore, recruitment for music therapy session should be an ongoing process and involves the collaboration of staff members on the unit. With the constant busyness and high workload in the ICU, effective communication tools are necessary to facilitate such a process. Keast (2012) suggested a combination of two types of recruitment methods, passive recruitment and active recruitment, for single session intervention in hospital setting.

Passive recruitment refers to all non-direct communication to the target group with the provision of basic information about the program. Examples of passive recruitment include making flyers, brochures, and posters to be posted around the unit and hospital area, as well as to be distributed to patients and family members upon admission to the unit. The second form of recruitment is active recruitment which refers to direct communication to team members including staff members, multi-disciplinary professionals and doctors about the program, visiting patients and family members in the unit prior to music therapy session in order to understand their needs and explain how music therapy can assist with those needs (Keast, 2012). The goal of recruitment is to provide essential information to team members, family members and patients about the music therapy program, how it can help, and who can benefit from the program so they may refer potential participants to the music therapist. In addition, during the recruitment process, the credentialed music therapist could obtain essential information about potential patients, their health condition, specific needs and precaution measures which are essential in working in a high risk environment.

During the recruitment process, patients, family members, and team members could express their interest in, and need for, the music therapy intervention directly to the music therapist. To encourage and facilitate participation of staff members and multi-disciplinary team in the recruitment process, a referral form could serve as a communication tool between the music therapist and hospital personnel.

An example of one such referral form used by the researcher when she was providing music therapy services in the ICU is included as Appendix A in page 45 of this thesis (Eyre, 2008). Basic information such as patient's name, language(s) spoken, admission date, and room

number will facilitate the credentialed music therapist to situate the patient. Primary diagnosis and notes of pertinent information about the patient's current condition obtained in the referral form will help the credentialed music therapist to plan the session with appropriate precaution. Furthermore, the specification of reasons for referral would be useful for the credentialed music therapist when determining session goal(s) and objectives as well as ensuring that the direction of the session plan is congruent with the general treatment plan of the medical team of the unit.

Phase two: assessment. Although basic information about the patient can be gathered on the referral form, a careful and thorough assessment should be carried out when the credentialed music therapist first encounters the patient at the beginning of the session to assess the state of the patient in the present moment. This assessment shapes the direction and format of the music therapy session. As this research focuses on the reduction of state anxiety, only the assessment that relates to informing appropriate intervention for state anxiety reduction such as assessment of level of consciousness, assessment of state anxiety level, and assessment of musical preferences will be discussed. Assessment should be executed in an effective manner to ensure that there is enough time to address salient issues of the session through music therapy interventions.

Assessment of level of consciousness. Patient's level of consciousness is the first consideration of the direction of the session. Level of consciousness among mechanically ventilated patients in the ICU can vary from being fully conscious, indicate by the presence of alertness, wakefulness, and awareness to being in low awareness state, to the state of coma.

Researchers have shown the ability of music therapy to evoke physiological changes in and provide psychological support for patients in low awareness states (Magee, 2005). However, music therapists should be aware that when a patient is in a medically induced coma, the reason for such a procedure is often to put the brain on rest to avoid swelling. Therefore, the session should not aim for arousal but instead to enhance calmness and stress reduction. In certain circumstances, the execution of music therapy session may be contraindicated. Music therapist should consult the nurse in charge of the patient to determine if music therapy session is appropriate for the patient at the moment. Careful planning of the employment of musical elements and constant monitoring of all biological and emotional changes in patients should be considered to provide adequate level of stimulation but not over-stimulation to avoid adverse effect (Tamplin, 2003).

Assessment of state anxiety level. Several measuring scales that measure patients' level of state anxiety for clinical trial purposes were referenced in the literature. Among them were the Spielberger State-trait Anxiety Inventory (STAI), Anxiety Faces Scales (FAS), Beck Anxiety Inventory (BAI), Hospital Anxiety and Depression Scale-Anxiety (HADS-A). Observable measurement consists of vital sign information on monitors attached to patients that may include heart rate (HR), systolic blood pressure (SBP), diastolic blood pressure (DBP), mean arterial blood pressure (MAP), and arterial oxygen saturation (SpO2). Qualitative assessment tools such as nurses' evaluation and patients' self-report were also discussed in the literature.

Through the researcher's experience, each institution has its own tool of assessment that should be accessible to the music therapist to evaluate the patient's anxiety level. It is helpful for the music therapist to be informed and learn about her or his institution's relevant assessment tool(s) in order to share a common language and understanding with other team members of the unit. Other than the aforementioned measurable scales, patient self-report on her/his own state, team members and/or family members' reports on patient's condition, and the credentialed music therapist's observation on patient's facial expression and body languages are all important information in the assessment phase. Perceivable measurements such as vital signs on monitors are also accessible for the credentialed music therapist to take note of in order to assess and observe changes throughout the session.

Assessment of musical preferences. Single session music therapy intervention is intended to be a one-time therapeutic encounter. Familiar music based on the patient's tastes have shown to promote feelings of security and facilitate relaxation. A patient's musical preference could be assessed through verbal assessment directly from the patient or from the patient's family members and sometimes, through staff members. Musical preferences are often associated with significant memories of the patient and serve as an important piece of information for goal establishment and choice of intervention for the session. The music therapist should also have available a variety of music spanning different eras, styles and cultures, to facilitate the assessment procedure.

Phase three: intervention. The attention span of mechanically ventilated patients in the ICU is generally brief; while the suggested duration of an average music therapy session is 30-45 minutes, in some cases patients might only be able to sustain a session of a few minutes. Therefore, it is important for the credentialed music therapist to identify the most salient issue

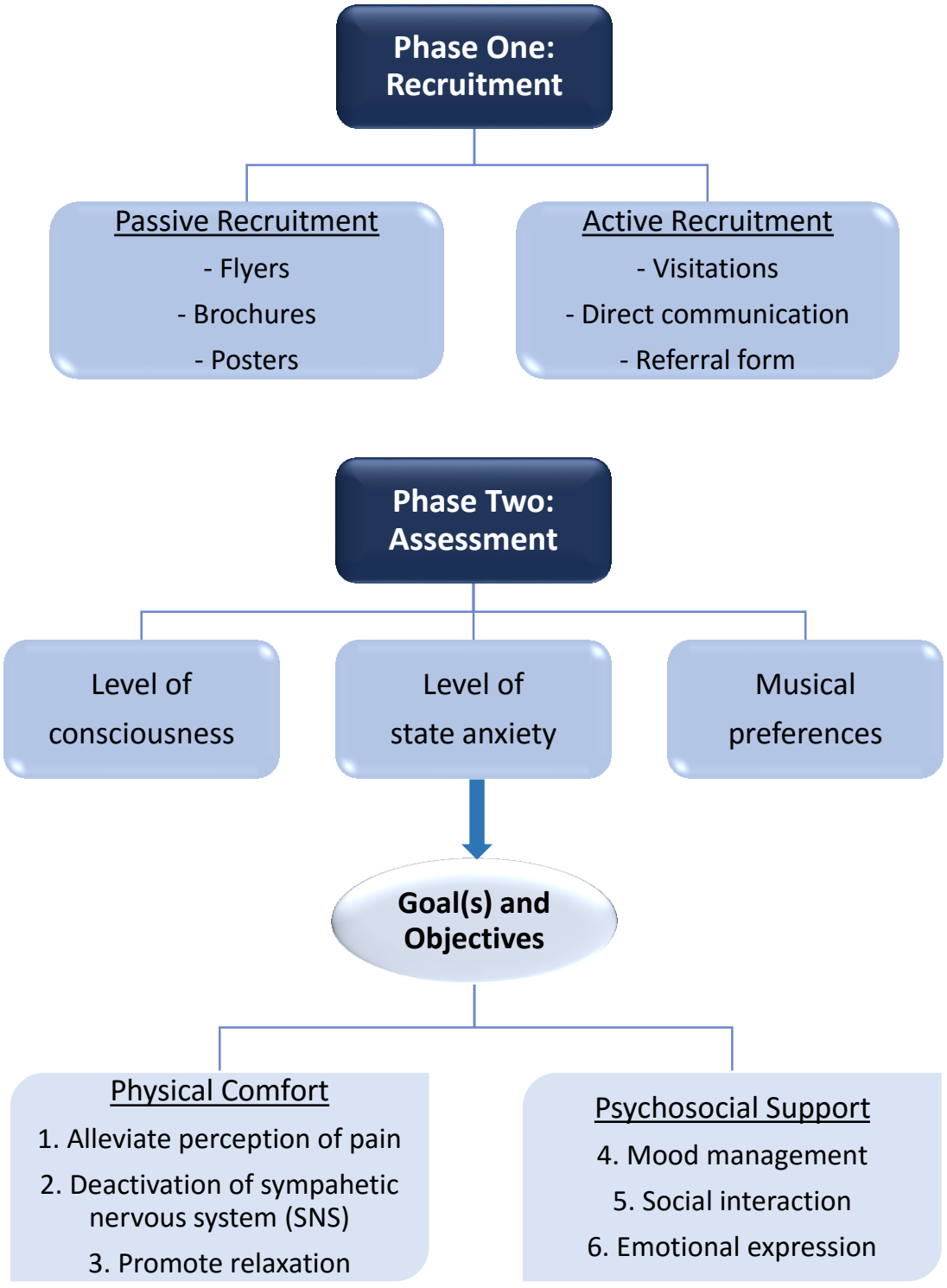
based on the imminent need of the patient through assessment, and to focus on one main goal within the time of the session. Exception does occur with patients who are in a more optimal health condition where he/she has more energy to sustain a longer session. However, the credentialed music therapist should be aware of the fragility of the patients and be ready to terminate the session at any time based on the patient's best interest and well-being. After determining the goal(s) and objectives of the session, a spectrum of active and receptive music therapy interventions could be used according to the state of the patients in order to achieve the goal determined. Goals and objectives of single session music therapy intervention for mechanically ventilated patients in ICU have been discussed earlier in this thesis in the section "Goal(s) and objectives" and also illustrated in Table 1 (see p.29).

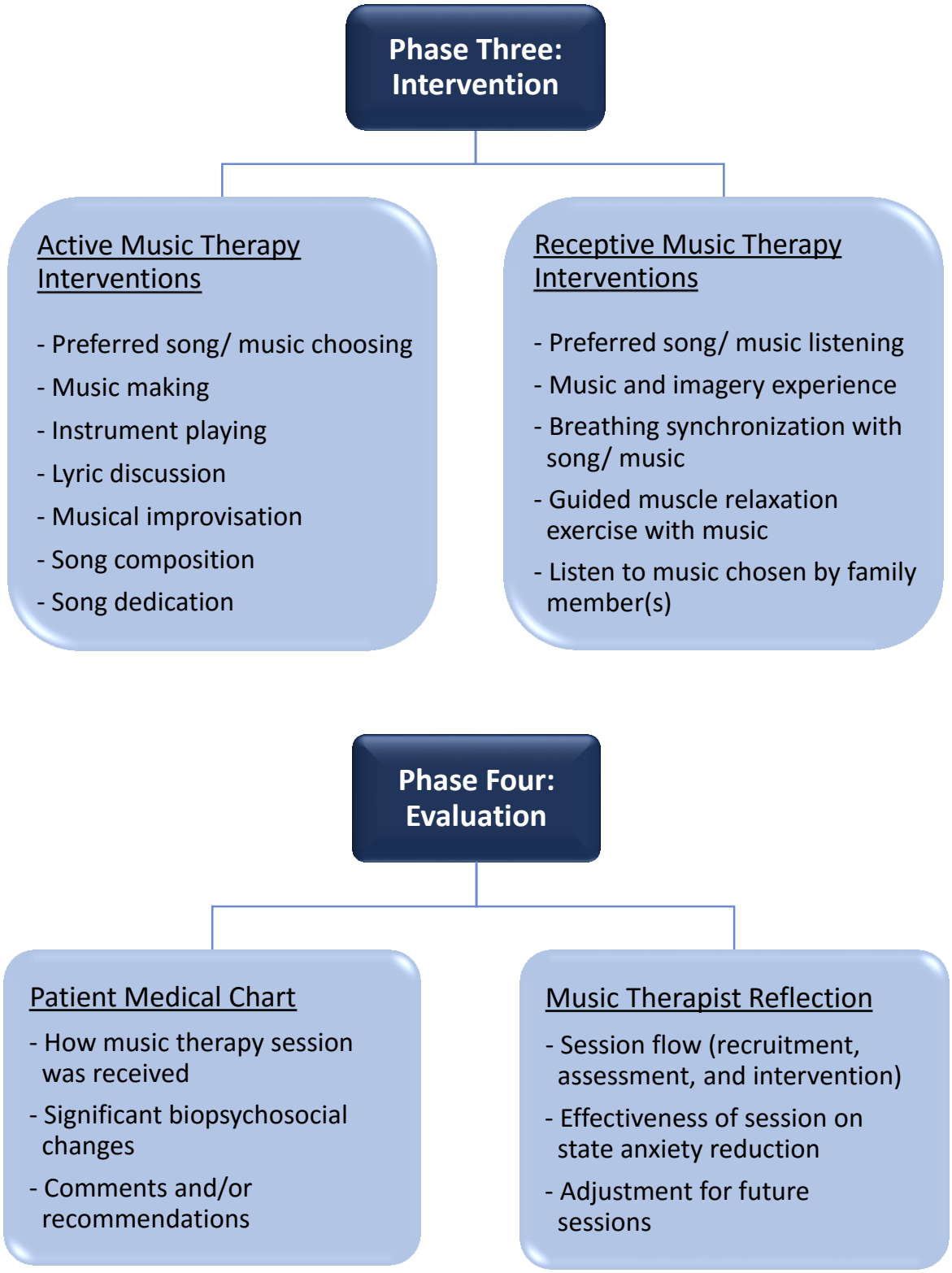
Phase four: evaluation. Evaluation is as important in a single session intervention as it is in multiple session intervention, particularly in the ICU where a patient's condition might change dramatically within minutes. The credentialed music therapist may be exposed to a situation where he/she is required to make quick clinical decisions based on changes that occur during the time of the session. Therefore, to set apart a few moments after each music therapy single session for evaluation is essential for the credentialed music therapist to reflect on the session, report on the patient's medical chart, and to keep track of her/his clinical work. Rigorous evaluation is necessary to ensure best practices at all times. If possible, the credentialed music therapist should document relevant session information in the patient's medical chart to inform team members about how the music therapy session was received, report significant biopsychosocial change(s) occurred during the session, and make recommendation or comments if needed. The credentialed music therapist should also take time to reflect on the session flow of recruitment, assessment, and intervention, the effectiveness of intervention(s) used in the reduction of state anxiety, and any needs for adjustments in future sessions. These reflections should be kept as personal, confidential clinical notes. It is important to note that these records should contain no identifiable information related to any patient in order to respect the ethical principles of confidentiality.

The four-phase single session music therapy intervention protocol for mechanically ventilated patients in the ICU is illustrated in Table 2 (see p.35-36). This table has been created as a summary and visual guide to facilitate the decision making procedure for credentialed music therapist working with mechanically ventilated patients, focusing on state anxiety reduction.

Table 2.

Four-Phase Single Session Music Therapy Intervention Protocol for State Anxiety Reduction in Mechanically Ventilated Patients




Phase Three: Intervention
Active Music Therapy Interventions
- Preferred song/ music choosing
- Music making
- Instrument playing
- Lyric discussion
- Musical improvisation
- Song composition
- Song dedication
Receptive Music Therapy Interventions
- Preferred song/ music listening
- Music and imagery experience
- Breathing synchronization with song/ music
- Guided muscle relaxation exercise with music
- Listen to music chosen by family member(s)
Phase Four: Evaluation
Patient Medical Chart
- How music therapy session was received
- Significant biopsychosocial changes
- Comments and/or recommendations
Music Therapist Reflection
- Session flow (recruitment, assessment, and intervention)
- Effectiveness of session on state anxiety reduction
- Adjustment for future sessions

Chapter 5. Discussion

This intervention protocol is an effort by the researcher to use her experience working in medical settings and in the intensive care unit to raise awareness of the needs of mechanically ventilated patients receiving care in the ICU. Every moment, they are dealing with great challenges physically, psychologically, and socially during their treatment and yet their needs are not always properly addressed due to the limitations of their health condition. The researcher wishes to share her findings about the possibility of providing quality services of music therapy to this population and meeting their biopsychosocial needs.

Limitations

The scope of time of the master's degree allows for only the design of this single session protocol without the possibility of being tested. Although the proposed design is based on the clinical experience of the researcher, her experience of working in the intensive care unit was limited to one hospital within a relatively short period of time during one school term. Also, this research was guided by the bias and assumption of the researcher that music therapy is a better form of intervention then music listening alone. Other limitation of this study includes the limited number of available literature resources on ICU and mechanical ventilation at the time of the compilation of this research. Despite the listed restraints, positive feedback and interest in the project were received continuously throughout the time the researcher was in the unit. Promising results of how music therapy can reach out to mechanically ventilated patients in a way unique from other treatment methods have been observed by the researcher and reported by family members of patients and team members in the unit. These observations and feedback have strengthened the researcher's belief that there is a need to establish a bridge between the ICU and the music therapy profession. The ICU needs to be better informed about the existence of this intervention method which could greatly benefit their patients, and music therapists need to be aware of the potential of music therapy work in the ICU.

Challenges

One of the biggest challenges of designing this single session music therapy intervention protocol is the adaptation of the conventional music therapy session format into the unique environment of ICU. As discussed throughout this thesis the ICU is a fast-paced unit and patients

in the unit are in vulnerable and critical conditions. Patients' energy and attention spans are limited, and their time of stay in the unit is often brief. This special ICU setting makes the standard music therapy intervention format which involves an evolution over multiple sessions and ability to track changes within the therapeutic process impossible to implement. This may explain the reason of the fact that the majority of researches and articles published about music intervention used in the ICU are mostly music listening experiences and not music therapy interventions which require to be administered by a credentialed music therapist. This intervention research is an attempt to demonstrate some adaptations and utilizations of different music interventions by a credentialed music therapist through a music therapy process and how it could achieve state anxiety reduction in responding to the biopsychosocial needs of ICU patients. Further, this intervention research suggests that it is possible to ensure quality therapeutic services in a single encounter that respects the therapeutic process of assessment, intervention, and evaluation.

Implications

The needs of patients receiving care in the ICU are vast. It is therefore the wish of the researcher that this research will serve as an introduction to the possibility of the implementation of high quality music therapy services in the ICU. The researcher also hopes to sensitize the music therapy community and the medical community to the fact that music therapy can contribute to the well-being of mechanically ventilated patients experiencing state anxiety, using the single session music therapy intervention protocol illustrated. In addition, the sharing of the researcher's own personal and clinical experience in the ICU could serve as an inspiration for other credentialed music therapists to create music therapy programs in the ICU of hospitals. The four-phase single session music therapy intervention protocol is an attempt to gather and organize available information to formulate an intervention tool for credentialed music therapists who wish to establish a new program in the ICU. This protocol will help to initiate the music therapy program so credentialed music therapists can adapt this basic intervention structure to their own environment and needs of the patients, all while respecting the therapeutic process within each session to ensure the best practice.

Recommendations for Future Research

It is the hope of the researcher that this intervention research will inspire more clinical work and research with this population. This thesis is limited to include only the first and second steps of the five steps model of Fraser and Galinsky's (2010) intervention research model. It is within the wish of the researcher that steps three to five of the model be carried out in the future to add to the findings of this research. Just as all newly established protocols require, this four-phase single session music therapy intervention protocol needs to be tested in clinical trials and details need to be refined in order to turn theories into evidence based practices. Although limitations and challenges existed throughout the compilation of this intervention research, the researcher hopes that this protocol will serve the music therapy community by encouraging more music therapy clinical work opportunities and also inspiring more music therapy research among the population of patients receiving care in the ICU.

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Appendix A: ICU Music Therapy Referral Form

Name of patient: _____

Language(s) spoken: English / French / Other (please specify): _____

Date of admission: _____ **Room number:** _____

Primary diagnosis: _____

_____

Reason(s) for referral:

Distraction from pain perception

Promote relaxation

Decrease agitation

Mood management

Provide emotional support

Encourage expression

Notes:

_____

_____

_____

_____

Referred by (Please print): _____

Signature: _____ **Date:** _____

Sung Tak (Josephine) Lee, MTA
February, 2016
Adapted from (Eyre, 2008)