

MUSIC THERAPY FOR PATIENTS WHO ARE MECHANICALLY VENTILATED:  
A PHENOMENOLOGICAL STUDY

A Thesis  
by  
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## **Abstract**

### **MUSIC THERAPY FOR PATIENTS WHO ARE MECHANICALLY VENTILATED: A PHENOMENOLOGICAL STUDY**

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The purpose of this study was to describe how music therapists provide care for adult patients in the intensive care unit on mechanical ventilation. A short electronic survey was sent to board-certified music therapists to gather data on those working with patients on mechanical ventilation in adult medical settings. The researcher interviewed five music therapists who responded to the survey about their clinical work with patients on mechanical ventilation. Most results were consistent with existing literature: interviewees described types of patients supported, interventions and related goals, family support, challenges, interactions with staff, music selection, and seeking best practices. Interviewees also discussed contraindications of using patient-preferred music, which deviates from prior findings. Future research is warranted to examine the nuances of music therapy within the spectrum of life support. Additionally, exploring patient perspectives of music therapy during mechanical ventilation after extubation may provide insight into

the styles of music best suited for patients on mechanical ventilation. Finally, as the presence of family members seems to have a significant impact on patients' experience of mechanical ventilation, future research could investigate outcomes of incorporating families and caregivers into sessions.

*Keywords:* music therapy, mechanical ventilation, intensive care

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## **Chapter 1**

### **Introduction**

Mechanical ventilation (MV) is a form of life support used regularly in hospital settings. MV provides respiratory support to hospitalized patients by delivering mechanical breaths through an endotracheal tube, decreasing the work of breathing and stabilizing patients with a variety of respiratory issues (Walter et al., 2018). MV is used during medical operations when people are administered general anesthesia and are unconscious, for critically ill patients in intensive care units (ICUs), and on an outpatient basis for those who cannot breathe independently (Torpy et al., 2010).

Within the ICU, common causes for MV include respiratory failure from pneumonia, chronic obstructive pulmonary disease (COPD), acute respiratory distress syndrome (ARDS), sepsis, and multiorgan system failure (Torpy et al., 2010). While MV is used for life support measures, cumulative exposure to higher intensities of MV is harmful and associated with higher mortality rates (Urner et al., 2020). Mortality of mechanically ventilated patients depends on factors at the beginning of MV, as well as development of complications and patient management in the ICU (Esteban et al., 2002).

MV is the most common technological support in ICUs, with 20-40% of all ICU patients requiring MV, prior to COVID-19 (Halpern, n.d.). Close to one million individuals endure MV each year in the U.S. with national costs estimated to \$27 billion, representing 12% of all hospital costs (Wunsch et al., 2010). MV is associated with significantly higher



daily costs and length of stay. Dasta et al. (2005) found that MV added an additional \$15,000-\$20,000 and 4-7 days to mean ICU cost and length of stay when compared to non-mechanically ventilated ICU patients.

### **Mechanical Ventilation Process**

Endotracheal intubation is a procedure in which a tube is placed into the lower trachea through the mouth or nose and connected to a mechanical ventilator (U.S. National Library of Medicine, 2021). After intubating and connecting the patient to the ventilator, clinicians must determine the mode of ventilation, including how the breath is delivered, the amount of mechanical assistance, flow, waveform, and rate of breath (Carpio & Mora, 2020). Ventilator settings are guided by the cause of respiratory failure, goals of MV, and the patient's comorbidities (Walter et al., 2018).

### **Spontaneous Breathing Trials**

Before a patient is ready for extubation, or removal of the endotracheal tube, the patient must be able to maintain adequate gas exchange, cardiovascular reserve, and protect their airway. Once these criteria are met, a respiratory therapist will conduct a spontaneous breathing trial (SBT) to determine if the patient can breathe independently and is ready for extubation, or removal of the endotracheal tube. Prior to an SBT, the patient's nurse reduces sedation, so the patient is awake and responsive. A respiratory therapist then lowers ventilator support to a minimum for 30 to 120 minutes to assess whether the patient can breathe independently while still intubated. If the patient appears stable after the first few minutes of an SBT, the respiratory therapist may leave the room to start another SBT; however, ventilators are programmed to deliver breaths if patients stop breathing spontaneously. If the patient meets specific biomarkers indicating sufficient respiration and

oxygenation and does not show signs of distress, the endotracheal tube is removed (Carpio & Mora, 2020). Following extubation, the patient is monitored for possible reintubation.

### **SBT Outcomes**

The majority of patients successfully extubate after the first SBT without difficulty, whereas 31% of patients fail initial weaning and require multiple SBTs to achieve liberation from ventilatory support (Boles et al, 2007). When SBTs fail, respiratory therapists readjust the ventilator modes to support the patient's respiratory needs while avoiding diaphragm muscle atrophy. When intubation is required for a longer period of time, patients may undergo a tracheostomy, a surgically placed breathing tube through an incision in the neck, as prolonged intubation can result in damage to the trachea, mouth, vocal cords, lungs and diaphragm (Torphy et al., 2010). Factors that impact a patient's ability to wean include respiratory and cardiac load, neuromuscular, neurophysical, and metabolic pathologies, and anxiety and depression (Boles et al., 2007).

### **Experience of Mechanical Ventilation**

In addition to difficulty breathing, patients on MV experience anxiety, fear, pain, loneliness (Baumgarten & Poulsen, 2015; Thomas, 2003), delirium (Jeon et al., 2015; Ouimt et al., 2007), anxiety and fear when left alone, poor sleeping patterns (Rotondi et al., 2002), and loss of sense of control from communication issues (Logan & Jenny, 1997; Roberts et al., 2019). Furthermore, the intensity of patients' anxiety, fear, and loneliness depends on health professionals' presence with patients, as well as the presence of relatives during ICU stay (Baumgarten & Poulsen, 2015; Tate et al., 2012).

Anxiety, delirium, and agitation are associated with weaning difficulties, prolonged MV, extubation failure and reintubation (Jeon et al., 2015; Lindgren & Ames, 2005; Mart et

al., 2021). Woods et al. (2004) discovered that 16% of ICU patients experienced severe agitation, which resulted in more sedation, longer ICU stays, and longer time spent on the ventilator. While sedatives are typically used to relieve anxiety and agitation, increased sedation is associated with prolonged ventilation (Kollef et al., 1998; Lindgren & Ames, 2005).

### **Nonpharmacological Interventions**

The use of multicomponent “ABCDEF” bundles, composed of a small set of evidence-based practices (awakening and breathing coordination, delirium monitoring/management, early exercise/mobility, family), are an important independent predictor of reduced delirium and length of MV in the ICU (Balas et al., 2014; Kang et al., 2018; Mart et al., 2021). Other nonpharmacological interventions to manage symptoms associated with ICU stay include art therapy, occupational and physical therapy, meditation, prayer, acupuncture, massage, cold/heat therapy, guided imagery, energy medicines, music, and music therapy (Martorella, 2019; Rains & Chee, 2017; Tracy & Chlan, 2001). While these interventions manage symptoms during the period of MV, there are few studies examining nonpharmacological interventions during the ventilator weaning process.

### **Music in Medical Settings**

Music is a nonpharmacological, low-cost intervention that incorporates physiological and psychological components into a holistic approach towards improving health. Within medical settings, music is frequently used to reduce pain, anxiety, delirium. In a meta-analysis of 23 studies, Lee (2016) found that music decreased pain by 1.13 units on 0-10 scales, resulting in reduction of analgesic use. Similarly, in a Cochrane review, Bradt et al. (2016) found that music had a moderate pain-reducing effect and led to a small reduction in

heart rate, respiratory rate, and blood pressure in cancer patients. Personal preference in music has shown to be an influential factor in the efficacy of music for pain relief (Mitchell & MacDonald, 2006). Music also significantly decreases preoperative anxiety (Bradt et al., 2013b; Bringman et al., 2009; Gillen et al., 2008;) and can be an alternative to sedatives and anxiolytics. Within the ICU setting, music is cited to reduce delirium and decrease vital signs (Johnson et al., 2018; Khan et al., 2020).

### **Music Therapy**

Music therapy is the clinical and evidence-based use of music interventions to accomplish individualized goals within a therapeutic relationship between a client and a board-certified music-therapist (American Music Therapy Association, 2021 a). Music therapists undergo extensive coursework in the fields of music, psychology and science at approved four-year degree programs, and complete 1200 hours of supervised clinical training before taking the music therapy board certification exam. Clinical music therapy is the only professional, research-based discipline that applies supportive science to experiences of music for health treatment and educational goals (American Music Therapy Association, 2021a).

The field of music therapy is an evidence-based health profession built on a strong foundation of research. Specifically within medical settings, music therapy has been found to significantly reduces stress (Mandel et al., 2019), anxiety (Millett & Gooding, 2017), and pain (Golino et al., 2019); provide procedural support (Walworth, 2010); and improve overall quality of life and patient satisfaction (Yinger & Standley, 2011). A reduction in stress, anxiety, and pain may lead to lower dosages of analgesics and anxiolytics, improved

treatment compliance, and decreased length of hospitalization, therefore contributing to the value of music therapy as a service in hospitals.

### ***Medical Music Therapy***

Medical music therapy involves working with patients in various medical units, during diverse procedures, and with various medical diseases and disorders (Allen, 2012). Bruscia (2014) specified that goals of medical music therapy include “addressing biomedical needs of the patient, as well as working through emotional, interpersonal, social, spiritual, and ecological issues that arise for the patient and family during the illness and its treatment” (p. 218). Medical music therapy research documents clinical work with populations including pediatrics, oncology, pain management, surgical patients, HIV/AIDs patients, cardiac, burn, and transplant patients, orthopedics, neurology, intensive care units, ventilator-dependent patients, obstetrics, hospice, palliative care, and support groups (Allen, 2012).

### ***Interventions***

In medical settings, music therapists use a variety of interventions and techniques. *ISO principle* is a technique in which music stimuli is matched to the client’s behavior, mood, or physiological state and slowly adjusted in complexity, volume, and tempo to produce a change in the client (Yinger, 2018). *Entrainment* is a phenomenon of auditory-motor coupling in which the motor system synchronizes to a steady rhythmic pulse (Yinger, 2018). *Sensory grounding* is the use of connection to the five senses to reduce anxiety (Altman, 2014, p. 47). *Positive stimulation or music listening for sensory stimulation* is the presentation of “age-appropriate, patient-preferred music, either live or recorded, to enhance environmental stimulation” (Allen, 2012, p. 151).

### **Music Medicine**

The majority of existing literature on music and MV consists of music medicine studies. Music medicine refers to the use of recorded music without the presence of a board-certified music therapist (Yinger & Gooding, 2014). Music medicine interventions consist of passive listening to recorded music administered by hospital staff through headphones or speakers. In contrast to music therapy, there is no specialized training or certification for the practice of music medicine. Music medicine is simply recorded music, which cannot change in the moment to fit the patient's needs. Music therapists meet patient needs in real time by tailoring each session to the individual, through song selection, altering characteristics of music (such as tempo and dynamics) as appropriate, and responding in a way that best supports the patient. Furthermore, the relationship developed between client and therapist is cited to contribute to the treatment outcome (Silverman et al., 2016).

Patients on MV frequently experience anxiety, delirium, and agitation, which are associated with weaning difficulties, prolonged MV, extubation failure and reintubation, and consequently longer ICU and hospital stay (Jeon et al., 2015; Mart et al., 2021). While sedatives are typically used to relieve anxiety and agitation, increased sedation is associated with prolonged ventilation (Blair et al., 2019; Kollef et al., 1998; Lindgren & Ames, 2005). Additionally, patients on MV experience intense vulnerability, anxiety, fear, and loneliness (Thomas, 2003; Roberts et al., 2019). Furthermore, a single music medicine intervention can decrease anxiety and reduce physiologic measures including heart rate, blood pressure, and respiratory rate in patients on MV (Bradt & Dileo, 2014; Hetland et al., 2015; Jaber et al., 2007; Lee et al., 2005; Umbrello et al., 2019; Wong et al., 2001).

## **Purpose and Research Questions**

There are few studies on music medicine and music therapy for patients on MV and during the MV weaning process. There is a need for more information regarding music therapy for patients who are mechanically ventilated, especially as the COVID-19 pandemic continues to impact many patients in ICUs. The purpose of this study was to describe how music therapists provide care for adult patients in the ICU on MV. The subquestions of this study include:

- What interventions do MTs use with patients who are mechanically ventilated?
- How do MTs support the family of patients on MV?
- What challenges do MTs face when working with patients on MV?

## **Chapter 2**

### **Literature Review**

The following section will examine the existing literature within medical settings, for patients on MV, and for patients undergoing the ventilation weaning process. The literature reviewed includes both music medicine and music therapy publications.

#### **Music Therapy in Medical Settings**

Within medical settings, the effects of music therapy interventions with adult patients have been explored with oncology, pain management, surgical patients, HIV/AIDS patients, cardiac, burn, and transplant patients, orthopedics, neurology, intensive care units, ventilator-dependent patients, obstetrics, hospice, palliative care, and support groups (Allen, 2012).

Multiple meta-analyses and systematic reviews have demonstrated the efficacy of music therapy in medical settings (Bradt et al., 2013a; Bradt et al., 2013b, Bradt et al., 2016; Yinger & Gooding, 2015). Bradt et al. (2013a) completed a Cochrane review comparing music interventions and standard care with standard care alone for people with coronary heart disease (CHD). Results from 26 randomized and quasi-randomized controlled trials indicate that music interventions may have a beneficial effect on systolic blood pressure, heart rate, respiratory rate, quality of sleep and pain for persons with CHD. Of 26 trials examined, only three studies included a trained music therapist, and music listening was the main intervention used. Anxiety-reducing effects appeared greatest when people were given a choice of music to listen to. The authors noted that the clinical significance of these



findings was unclear, as many of the studies had high risk of bias and suggested that more research is warranted to examine the effects of music interventions offered by trained music therapists.

In a Cochrane review of 52 trials including 3,731 participants, Bradt et al. (2016) found that music interventions may have a beneficial effect on anxiety in people with cancer. Authors categorized 23 trials as music therapy trials and 29 as music medicine trials. Results suggested that music interventions may lead to small reductions in heart rate, respiratory rate, and blood pressure, with a moderately strong, positive impact on depression. Additionally, results demonstrated a moderate effect of music therapy interventions for patients' quality of life, with no evidence of an effect for music medicine interventions. The authors caution interpretation of results; however, as the majority of studies presented a high risk of bias.

Similarly, Bradt et al. (2013b) examined the effects of music interventions with standard care versus standard care alone on preoperative anxiety in surgical patients in a Cochrane review. Of 26 trials with 2,051 participants, all studies used pre-recorded music listening. Results suggested a beneficial effect on preoperative anxiety with small effects on heart rate and diastolic blood pressure. One study indicated that music listening was more effective than a sedative in reducing preoperative anxiety and physiological responses. Authors concluded that music interventions may be a viable alternative to sedatives and anti-anxiety drugs. While all trials in this review used pre-recorded music listening, the authors specified a need for randomized controlled trials that examine live, interactive music experiences provided by trained music therapists, as music therapists are trained to select music and interventions that meet patients' specific needs.

Yinger and Gooding (2015) conducted a systematic review of music-based interventions for procedural support. Of 50 included studies, 44 were categorized as music medicine studies, and 46 studies used recorded music interventions. Results of two studies suggested that patient-preferred music listening had a significant effect on pain. Two music therapy studies with significant benefits used interactive interventions with live music that was tailored to patients' needs and preferences. Authors cautioned clinical implications; however, as the majority of studies reviewed had a high risk of bias, inadequate intervention reporting, and mixed results.

Multiple Cochrane reviews, meta-analyses and systematic reviews within medical music therapy have found that music interventions improved pain, anxiety, depression, and quality of life, as well as physiological markers including blood pressure, heart rate, and respiratory rate across various populations (Bradt et al., 2013a; Bradt et al., 2013b; Bradt et al., 2016). Furthermore, patient-preferred music had a significant effect on outcome measures (Yinger & Gooding, 2015). Authors voiced needs for randomized controlled trials that examine live music therapy experiences with improved intervention reporting and lower risk of bias.

### **Music Medicine and Mechanical Ventilation**

Most existing literature on music and MV consists of music medicine studies. In a Cochrane review examining music interventions for patients on MV, Bradt and Dileo (2014) found that music consistently reduced respiratory rate and systolic blood pressure, which impacted the use of sedatives and analgesics. Of the 14 trials analyzed, only one was categorized as music therapy; the others were music medicine and did not provide specific information about the music interventions. Additionally, researchers did not find any studies

that examined the effects of music on quality of life, patient satisfaction, or cost-effectiveness.

Hetland et al. (2015) conducted a review of the influence of music during MV and the weaning process. Of 18 studies reviewed, 17 consisted of music medicine interventions; only one study was categorized as music therapy. All studies utilized music interventions for relaxation. Results of the studies indicated improvement in patients' psychophysiological symptoms, including agitation, physiological arousal, biomarkers of stress response, and self-reported anxiety. Additionally, music was well-received by patients and staff across multiple studies. Authors noted that a decrease in distressing symptoms could encourage a relaxation response, subsequently reducing the need for sedatives and eventually decreasing overall length of time on MV. The authors noted a critical need for studies examining the use of music for ventilator weaning, as only one study in the review explored the effects of music during the actual weaning process. Furthermore, authors stated a need for randomized clinical trials with adequate power, as many studies in the review had small sample sizes, limiting the generalizability of results.

Two literature reviews have demonstrated the efficacy of music interventions for patients on MV. These studies have cited improvements in agitation, anxiety, biomarkers of stress, and markers of physiological arousal including heart rate, respiratory rate, and blood pressure (Bradt & Dileo, 2014; Hetland et al., 2015).

### **Ventilation Weaning**

Liang et al. (2016) explored the effect of a music medicine intervention on physiologic variables, dyspnea, anxiety, and weaning duration in patients on prolonged MV during weaning trials. Participants were randomized to music or no music groups in a

crossover repeated measures design, and the music or no music intervention occurred for three days in a row. Researchers created playlists based on participant preference and music listening lasted for 60 minutes during weaning trials. Results indicated that patient-selected music significantly decreased heart rate, respiratory rate, anxiety, and dyspnea. Furthermore, participants had an increase in duration during daily weaning trials, and no participants exhibited agitation criteria for termination of the trial.

More recently, Park and Park (2019) examined the feasibility of music interventions for reducing agitation and anxiety during ventilator weaning. The researchers used Chlan and Heiderscheit's (2009) Music Assessment Tool (MAT) as a guide to create a playlist of each participant's preferred music. The study was conducted with a single group using a crossover design, with participants acting as their own controls. Participants listened to either preferred music or classical relaxation music via headphones for the first 30 minutes of a pressure-support ventilation weaning trial (PSV). PSV is a mode of positive pressure MV in which the patient triggers every breath, providing the patient more control over flow delivery and respiratory rate (Abramovitz & Sung, 2021). After the initial 30 minutes of music listening, participants had a 60-minute washout period of silence before another 30 minutes of music listening. Those who first listened to preferred music listened to classical, and vice-versa. The researchers assessed anxiety and agitation before and after both 30-minute music listening interventions. Results indicated that both preferred and classical relaxation music interventions were effective for improving agitation and anxiety during weaning; however, generalization of these findings is limited by the study's small sample size.

The sole music therapy study in both Bradt and Dileo's (2014) Cochrane review and the review by Hetland et al. (2015) review examined music therapy during the ventilation

weaning process. Hunter et al. (2010) sought to evaluate the feasibility of incorporating music therapy into the weaning process. Patients who were admitted to a pulmonary step-down unit for long-term weaning received 45–60-minute music therapy sessions during weaning trials. Patients undergoing long-term weaning had a tracheotomy and were no longer intubated. Sessions began 20 minutes prior to the start of the trial and continued up to 40 minutes into the trial. If patients were scheduled for longer trials spanning several hours, the session began halfway through the trial. The music therapist used patient-preferred music, active music-making, improvisation, and music-assisted relaxation interventions. Session goals changed over time based on the weaning process, and patients received an average of four music therapy sessions. Researchers administered nurse and patient surveys after sessions.

Results indicated an 84% study completion rate with 100% of patients stating they would participate in music therapy again, demonstrating feasibility of music therapy during the weaning process (Hunter et al., 2010). Findings also suggested a reduction in heart rate, respiratory rate, perceived stress and anxiety, as well as a positive nurse response to the intervention. These results must be considered with care, as the study used matched historical records instead of a control group for comparison. Additionally, this study lacked specific, easily identifiable and quantitative outcome objectives.

### **Spontaneous Breathing Trials**

Philips (2007) examined the effects of music entrainment on the respiration of patients during SBTs. A total of 39 patients admitted to either the medical/surgical or cardiovascular/surgical intensive care units on short-term (1 to 10 days) MV were randomized into experimental and control groups. Participants in the experimental group

received one 25-minute live music therapy session during their SBT. The researcher used guitar and voice to provide live, patient-preferred music that was matched to the patient's respiration rate. Cardiac and medical patients received slightly different interventions according to the difference in need for MV. Cardiac patients were placed on MV for support during surgery; medical patients were placed on MV because of respiratory insufficiency due to illness or injury. Vital signs of cardiac patients were typically lower than desired, so the music intervention was used to increase vitals. Conversely, vital signs of medical patients trended higher, and the goal of the music was to decrease vitals for ranges appropriate for extubation. In both cases, the goal of the intervention was to normalize vital signs.

The researcher multiplied the patient's initial respiratory rate by four to determine the beginning tempo (Phillips, 2007). The researcher played music in 4/4 time and accented every first beat with the goal of entraining a four-beat inhale and four-beat exhale pattern. The researcher listened to pre-recorded metronomic changes on a cassette tape played via earphones that either increased or decreased eight beats per minute every 2 minutes for 25 minutes.

Participants' Rapid Shallow Breathing Index, respiratory rate, heart rate, and oxygenation saturation levels were recorded before and after the SBT (Phillips, 2007). The Rapid Shallow Breathing Index of medical patients who received music therapy decreased, demonstrating that music could encourage deeper breaths. Respiration rates for experimental cardiac patients increased towards threshold and decreased towards threshold for experimental medical patients. Patients' heart rates increased slightly across experimental groups. Oxygen saturation decreased in both experimental groups, which could be due to the excitability of music therapy. While most results were not significant, trends in the data

indicated that music therapy can be an effective intervention during SBTs. Furthermore, two patients from the experimental group could recall the songs played and enjoyed the music therapy intervention.

In a similar study, Morris (2019) examined the impact of music therapy on anxiety and physiological metrics during an SBT. A total of 20 patients admitted to a medical–surgical ICU on short-term MV received one 30-minute music therapy session at the start of their SBT. The researcher used both patient-preferred and improvised, non-familiar music for music-assisted relaxation and entrainment interventions that were accommodated to participants’ needs. Music followed predictable chord progressions, included humming and singing in a sedative style and rhythmic entrainment to the patients’ respiratory rate. Agitation, delirium, pain, anxiety, and vital signs were recorded before and after the music therapy session.

Findings opposed the hypothesized direction: heart rate, respiratory rate, and blood pressure all significantly increased throughout the SBT (Morris, 2019). Participants who were interviewed after extubation reported feelings of vulnerability, fear, shame, frustration, and abandonment during their overall experience of MV. Despite an overall increase in vital signs throughout the SBT, participants noted positive associations with the music therapy session, stating that the music was “very soothing,” beautiful, peaceful, and emotional.

These are the only known studies in music therapy literature specific to the MV weaning process. Multiple studies cite benefits of music interventions using patient-preferred music during the MV weaning process, including decreased heart rate, respiratory rate, anxiety, agitation, and dyspnea (Hunter et al., 2010; Liang et al., 2016; Park & Park, 2019).

Additionally, both patients and hospital staff demonstrated positive responses to music interventions (Hunter et al., 2010; Morris, 2019; Phillips, 2007).



### **Researcher's Stance**

I became familiar with the intubation process during my music therapy internship at a large trauma hospital, where I observed and facilitated sessions with patients who were intubated. I learned about SBTs through interactions with my supervisor and respiratory therapists. Through observation and reading relevant literature, I imagined that the breathing trial experience was traumatizing for many patients.

I originally sought to explore ways in which music therapy could support patients during SBTs. The lack of literature with this population combined with a surge of intubations from the COVID-19 pandemic pointed to a need for research with patients on MV. Conducting a randomized controlled trial, however, was not feasible at the time. I then pondered how other music therapists were working with patients on MV, and whether they provided services during SBTs. These questions led me to develop the present study.

## **Chapter 3**

### **Method**

This chapter will describe the research method of this study. This includes the research design and procedures, study sample, survey instrument, data collection and data analysis.

#### **Research Design**

This study followed a phenomenological design. The researcher sent a short electronic survey (see Appendix A) to board-certified music therapists to gather data on those working with patients on MV in adult medical settings. The researcher then contacted five music therapists for follow-up interviews regarding their clinical work with patients on MV. An interview guide (see Appendix B) provided a semi-structured interview format. The interview questions were based on previous survey research (Tart, 2019). Appalachian State University Institutional Review Board reviewed and declared this study exempt (IRB# 22-0077).

#### **Sample**

Email addresses of board-certified music therapists (MT-BCs) were obtained from the Certification Board for Music Therapists (CBMT). The first survey question was designed to identify music therapists who worked in adult medical settings. The researcher filtered survey results to identify respondents who reported working with patients on MV and organized data according to reported frequency, ranging from “daily” to “a few times per

year.” The researcher then selected five respondents who indicated interest in a follow-up interview based on reported frequency, total years working with patients on MV, and range of experience ICU. The researcher and respondents scheduled individual interviews via Zoom that lasted approximately 30 minutes.

### **Survey Instrument**

The researcher constructed a 13-item online questionnaire to gather information on board-certified music therapists working with patients on MV. The questionnaire consisted of both discrete and open-ended response questions. Areas of inquiry included demographics as well as units and populations served within medical settings. The researcher piloted the questionnaire for feedback before sending it out with music therapists who were ineligible for the survey. Survey data were collected via Redcap, a secure online software.

### **Data Analysis**

The data analysis process was twofold: discrete results from the survey were summarized and interview transcripts were analyzed. Analysis of interview transcripts was guided by McFerran and Grocke’s (2007) method for phenomenological microanalysis. The intention of a phenomenological microanalysis is to “elucidate the experience in a way that captures its essential meaning to the person who is describing the event” (p. 269). This seven-step process occurred in two separate phases: an examination of individual experiences and a collective investigation.

Following McFerran and Grocke’s (2007) seven steps, interviews were transcribed and edited to remove repetitive language. The researcher then began distilling information by identifying key statements from interviewees’ responses. Key statements were classified into categories based on structural meaning units that were explicitly related to the interviewees’

statements. The fourth step, creating experienced meaning units, held the purpose of examining the underlying meaning of interviewees' responses, in which structural meaning units were regrouped into categories that reflected the underlying experience.

The researcher then revisited each transcript to develop a distilled essence for each interviewee. Individual distilled essences were sent back to the interviewees for verification of the researcher's interpretations. Once verified, interviewees' responses were examined collectively to identify collective themes. The final step was the creation of global meaning units and the final distilled essence, with the goal of "capturing the fundamental elements of the experience" (McFerran & Grocke, 2007, p. 277).

## **Chapter 4**

### **Results**

This chapter explores the results of both the survey and individual interviews. Discrete survey results are presented in respective tables. Interview results are organized by global meaning units and subthemes.

#### **Survey Results**

The researcher sent a 13-item survey to approximately 8,000 board-certified music therapists. A total of 174 music therapists completed the entire survey, of whom 93 indicated they were currently employed as an MT-BC in an adult medical setting and therefore continued the survey. The other 81 respondents noted they were not currently employed as an MT-BC in an adult medical setting and exited the survey.

Demographic results are summarized in Table 1. The largest number of respondents were ages 31–39 and zero respondents were over the age of 69. Respondents had been board-certified music therapists for an average of 11.6 years ( $SD = 9.36$ ). Regarding education, most respondents held a master's degree. The geographical location of respondents reflected the proportion of the regional membership of the American Music Therapy Association (American Music Therapy Association, 2021b) with most being from the Mid Atlantic, Great Lakes, and Southeastern regions. More than a third of respondents had completed specialized training in Neurologic Music Therapy and NICU music therapy, which were the most

common specialized or advanced training reported, followed by BMGIM Level 1 and Hospice/Palliative MT.

**Table 1**

*Demographics*

Question	Sum responses	%
Are you currently employed as an MT-BC in an adult medical setting?		
Yes	93	53.5
No	81	46.5
Age:		
21–29	18	19.4
31–39	37	39.8
41–49	18	19.3
51–59	13	14.0
61–69	7	7.5
Education:		
Bachelors	31	33.3
Masters	58	62.4
Doctorate	4	4.3
Location:		
Mid Atlantic	22	23.7
Great Lakes	20	21.5
Southeastern	18	19.4
Western	13	14.0
Southwestern	10	10.7
Midwestern	6	6.4
New England	4	4.3

Table 2 describes respondents' ICU and MV experience. Nearly half of respondents reported working in a medical/surgical intensive care unit, which was the most frequently described type of ICU, followed by cardiac ICU, neurological ICU, and other ICU. Over half of respondents reported they worked with patients on mechanical ventilation. Of those who

worked with patients on MV, a third of respondents noted they worked with these patients a few times per week, and nearly half of respondents reported they had five or more years of experience with this population.

**Table 2**

*Intensive Care Unit and Mechanical Ventilation Experience*

Question	Sum responses	%
In which units do you provide MT services?		
Medical/Surgical ICU	42	
Cardiac ICU	30	
Neuro ICU	22	
Other ICU	22	
Trauma/Burn ICU	17	
I do not work in an ICU	44	
Do you work with patients on MV?		
Yes	56	60.2
No	37	39.8
How frequently do you work with patients on MV?		
A few times a year	10	17.9
Once a month	4	7.1
A few times a month	14	25.0
Once a week	4	7.1
A few times a week	17	30.4
Daily	7	12.5
How long have you worked with patients on MV?		
Less than 1 year	3	5.4
1–2 years	11	19.6
2–3 years	10	17.9
4–5 years	5	8.9
5+ years	27	48.2

## **Interview Results**

The primary goal of the semi-structured interviews was to gain an understanding of music therapists' work with patients on MV. Interviewees also described their experiences with subpopulations of patients on mechanical ventilation within the ICU setting. The researcher assigned the pseudonyms Sarah, Gwen, Elaine, Vivian, and Alex to the interviewees. All interviewees were board-certified music therapists whose ages ranged from 21–39, and all but one had completed a master's degree. Interviewees had been board-certified for an average of 7 years, ranging from 2 to 9 years. Most interviewees worked with patients on mechanical ventilation daily. The following section is organized by global meaning units that emerged through application of McFerran and Grocke's (2007) data analysis process.

### ***Type of Patient Supported***

Interviewees discussed their work with subpopulations on mechanical ventilation in the ICU. Interviewees worked with mechanically ventilated patients on the spectrum of life support, including pre- and post-organ transplant patients, patients on extracorporeal membrane oxygenation and heated high flow nasal cannula, patients recovering from major surgery, undergoing ventilator weaning, patients with COVID and post-COVID, and patients at end-of-life. Sarah commented on the nature of working in the ICU:

There's so much we can do dependent on the level of life support to therapeutically help [patients] meet their goals. When I'm seeing a patient on extracorporeal membrane oxygenation, they might be far more able to do more active and interactive engagement in therapy than someone who is intubated and sedated or ventilated with a trach[eostomy].

Interviewees supported patients throughout the ventilator weaning process, including SBTs, ventilator weaning, regular and compassionate extubations, and those on a



tracheostomy collar. Interviewees also worked with intubated patients who were either sedated or alert.

### ***Types of Interventions***

Interviewees noted they primarily used receptive interventions for patients on MV. Four interviewees described how they used ISO principle and breath entrainment interventions to address anxiety and shortness of breath. Vivian defined entrainment as

adjusting the music according to the place the patient is in, in respirations and how they're presenting in general, like facial expressions, and then constantly adjusting the music according to what you're observing, whether it's their vital signs or how they're presenting to you.

Gwen combined entrainment with verbal diaphragmatic breathing cues and stated that the musical feedback in entrainment helped provide structure: "When you haven't breathed on your own for a while, it's like you're learning to do it all over again. So, giving [patients] that structure with the musical and rhythmic feedback is helpful."

Interviewees used sensory grounding and positive stimulation experiences to reduce anxiety and refocus attention. Sarah noted that sensory grounding "helps people feel comfortable in their space and what's happening around them, so that it doesn't feel like the world is closing in on them while they're trying to catch their breath." Sarah used music as positive stimulation to mask the noxious stimuli of the medical environment. Positive stimulation also served to "affect [patients'] physiologic indicators in a meaningful way to reduce anxiety—even if they're not able to interact, we can see [the effect] through their vital signs."

Music-assisted relaxation also redirected participants' attention away from the hospital setting. Alex vocalized the importance of live music for music-assisted relaxation, as live music can be accommodated and adapted to patients' needs. Gwen stated that the content

of relaxation scripts varied between patients; some people on MV did not want to think about their breathing at all. In these situations, Gwen chose music that was mid-tempo, had positive or motivational messages, and promoted a refocus of attention: “Maybe they’re doing some positive reminiscence to a memory associated with that song long enough to where they’re not sitting thinking, ‘Okay breathe in, breathe out.’” Similarly, Sarah also noted potential contraindications of relaxation scripts for people on MV. Sarah stated, “I shy away from anything focused on the breath because that can uptick someone’s anxiety when they already feel like they can’t catch their breath.”

For patients undergoing an SBT, Gwen shared that she often spent time with the patient before the SBT to build rapport and get an understanding of the patient’s baseline anxiety levels. Gwen stated, “I kind of use it as an opportunity to help them prepare for [the SBT] and know what to expect.” Gwen described using music-assisted relaxation interventions during SBTs with the goal of providing “respite” from the hospital room, informing patients, “We’re going to close our eyes and allow you to be somewhere completely different.” For music-assisted relaxation, Gwen stated she improvised on her guitar in three-four meter while leading the patient through an imagery script of a personalized “safe place.” Gwen noted that some patients requested to not be told when the ventilator is switched over to a spontaneous mode in order to remain focused on the imagery. For these cases, Gwen mentioned the importance of receiving patients’ permission prior to the trial and working closely with the respiratory therapist throughout the SBT process. Additionally, noting that communication with people on MV is often an issue, Gwen stated she asked for suggestions from family members about patients’ safe place for the imagery suggestions.

Sarah and Vivian offered insights in their work with COVID-19 patients. Sarah stated she collaborated with staff for telehealth sessions: “I have the nurse position the iPad so I can see the vital signs and the person, so I can be entraining and [monitoring] physiologic changes as we go.” Vivian noted the challenges of telehealth, stating, “It’s more challenging to do [sessions] virtually because you’re not in that space and not always able to catch all of the things..., so it’s still doable but not necessarily in the way we would like it to be.” In addition to receptive music therapy sessions, Sarah collaborated with family members to create personalized playlists for patients in the COVID ICU.

Active interventions were mentioned less frequently. Interviewees noted that the stage of recovery was an important factor in selecting active interventions. Elaine and Alex spoke about singing interventions as patients transitioned from invasive MV to a tracheostomy collar. Elaine stated, “Sometimes if they were getting [a tracheostomy] cap, we would usually collaborate with a speech therapist before having them sing.” Similarly, Alex described, “If they’re able to engage and sing with me, if they’re transitioning to a trach[eostomy], we might engage in some sort of structured lung-strengthening capacity [intervention].”

### ***Goals of Interventions***

All five interviewees discussed decreasing anxiety as a primary reason for referral for people on mechanical ventilation. Some interviewees received referrals to support patients specifically during SBTs; others received referrals to address anxiety after weaning had already started. Gwen spoke in detail about her work with patients undergoing SBTs, describing the experience from the patient’s perspective:

You wake up all of a sudden and you’ve got this tube in your throat, you can’t talk, you can’t swallow, and you’re trying to [breathe]. It’s terrifying to just think about,

and then add in visitor restrictions because of COVID, and you're on your own and don't have your loved one there to hold your hand.

Gwen noted the impact of anxiety on patients' physiological outcomes, stating, "Anxiety is psycho-emotional, but it also really impacts people's vials, so you could have someone who's tachycardic because they're really anxious." Similarly, Alex spoke about observing behavioral responses to music:

Before the music, was the patient anxious, restless, maybe hyperactive with their breathing? [I am observing] if the music was able to provide a change to where they're more laid back in their chair, maybe their eyes are closed, and their breathing patterns are more structured, diaphragmatic, and calm.

Interviewees used ISO principle, breath entrainment, and sensory grounding interventions to address anxiety and shortness of breath.

Psycho-emotional support was another goal mentioned among participants. Vivian spoke about the verbal processes and validation that can occur while intubated patients are awake. "There's a lot to cope with while you're vented... We're not getting into much deep processing, as that's not typically appropriate, but establishing the therapeutic relationship and then continuing care after [extubation]." For patients who received an organ transplant, Sarah and Gwen noted they use psycho-emotional processing to address the transplant process. Sarah described that she helped patients self-regulate and trust themselves in their bodies. Similarly, Gwen noted she "helped people process the idea of having an organ transplant, and what it means to receive a new organ and lose the organ you were born with."

Alex described the importance of providing opportunities for patient autonomy: [As a patient], you get dictated to a lot, not only from the pharmaceutical side, but from therapies and people coming in your room. So, a great opportunity for [patients] to feel [in control] is to have that music choice, and even tell me "No"; I'm an opportunity for them to say no to something, which can be very empowering.

Other goals addressed included cognitive stimulation, comfort and relaxation, reducing delirium, family support, relieving pain, spiritual support, and mitigating trauma.

### ***Family Support***

Each interviewee described their experience supporting families of patients on MV. Because communication with patients on MV is a challenge, interviewees said they sought to build rapport with family to gain insight on the patient's preferences, as well as support the family members themselves throughout the hospital stay. Alex discussed finding the balance of providing support for the patient as well as the family. "[Family] is very focused on the patient so we want to reflect that... But slowly, as we build rapport, trying to focus on guiding [the family] through relaxation."

Interviewees provided spiritual support to families during extubations. Sarah stated, "It's often at that point that I'm really helping support the people who are in the room through the extubation process; the music also inherently helps the family and the patient themselves." Elaine also noted she offered the "heartbeat project" to families during compassionate extubations, in which she created a recording of the patient's heartbeat for the family.

Sarah discussed the importance of autonomy in sessions with family members: "Music can be a wonderful way to mask [loud noises] and help provide control in a scenario where patients' family members don't have control over what's happening in the room." Sarah also noted she supported family by talking through the medical process and answering questions about procedures. Sarah stated, "Patients' loved ones look at us and ask, 'Is this normal?' And since we are an expert in the room, we can validate that yeah, this is pretty typical."

Interviewees spoke about incorporating family into the session through verbal song discussion and reminiscence. Sarah commented,

I have found good outcomes in saying, ‘Tell me about your loved one that we’re caring for; their music, something that’s important.’ And then you get to learn about this person, and [the family member] feels like they’re helping the patient, because they’re helpless otherwise.”

Similarly, Elaine noted that interactions with family ranged from completely musical to mostly verbal:

A lot of the interventions we utilized were either completely receptive, where we don’t do much talking, because all [the family] needs is time to listen to music with their loved one and cry and sing along. All the way to using one song and having a talk therapy session, helping them process their loved one on the ventilator, whether it was palliative or a good outcome. If they aren’t verbally processing, we will have them pick songs to get them engaged and reminiscing and talking about their loved one.

Gwen spoke about including family in sessions during SBTs:

I do everything I can to include that family member in what we’re doing, almost like they are paralleling what the patient is doing..., so when the patient looks around and starts to panic, they see, ‘Oh, they’re doing it with me, it’s okay.’

Gwen stated she included family in conversation about preferred music to redirect the patient’s attention away from the task at hand and instead towards memories associated with music. Gwen also explained how she collaborated with the patient and patient’s family to create a personalized playlist that lasted the specific duration of the SBT. Gwen stated, “When a person has this different idea of time..., [the SBT] is psychologically a lot more accessible to people.” In situations where family is unable to visit due to distance or visitor restrictions, Gwen remarked that the collaborative playlist not only benefits the patient but also “makes the family member feel like they’re doing something, because they feel helpless.”

## *Challenges*

Interviewees spoke about the challenges of timing and coordination with the medical team and family. Vivian noted the challenge of timing sessions around patients' sedation schedules. Similarly, Sarah commented on coordinating with staff and family for procedures such as SBTs and compassionate extubations: "It is really hard to nail people down and say, 'What time are you doing this and when should I show up?' Because there's no time frame in a major medical setting; time stands still and doesn't exist."

Interviewees also noted communication challenges with patients who were intubated. Elaine stated, "One of the harder things is when they are awake and can't communicate with you. How far do you go with trying to figure out what they're trying to tell you?" Likewise, Alex noted, "I think the volume is often [a challenge], as I primarily use an acoustic guitar, and I want to ensure my volume is something that is impactful... How much of it is my perception versus what they hear?"

Sarah discussed the challenge of dealing with family dynamics when working with patients on MV. Sarah described,

One of the biggest challenges we see in the ICU is bringing forth the family as the decision makers and asking them what their loved one would want. It puts people in very challenging situations... We see a lot of that, especially in COVID times because people are very emergently intubated.

Three participants also discussed the demanding nature of working with people on MV. Sarah spoke about witnessing trauma: "We have a lot of trauma responses that come up because of the initial injury, but then also for the prolonged intubation-sedation period, there is additional trauma that we are having to process with these patients." Likewise, Vivian noted, "There's the toll of seeing people in a really critical state repeatedly, or if it's an extubation but it's terminal or compassionate... those things are difficult." Gwen discussed

the challenge of working with people who were failing breathing trials due to physiological causes rather than psycho-emotional reasons. Gwen said, “There’s not a whole lot that I can do for a mucus plug or an issue with their tracheostomy leaking. I can be there, but I won’t be able to change a lot of those things, so that’s difficult.” Alex also spoke about the challenges of knowing the “acuity of impact” of sessions:

Let’s say I go to a room at ten o’clock and we have a 30-minute session. The patient went from having blood pressure through the roof, and I get them to a relaxed state. After I leave, I don’t get to find out if at three o’clock I had an impact through the rest of their day... I’m not able to follow up so that’s a challenge.

Finally, Sarah noted the lack of literature and evidence-based practices for both COVID populations and ICU delirium.

### ***Interacting with Staff***

Interviewees described their interactions with hospital staff. Elaine, Vivian, and Alex all noted positive responses from staff regarding music therapy. Elaine stated,

We don’t have any issues getting consults on people. I even had a critical care doctor see me with my guitar, and she said, ‘My patient is intubated and awake and he needs you!’ So they know the importance of [music therapy] for anxiety and such with ventilation.

Similarly, Alex noted that physicians, nurses, and palliative care team members were “great champions and advocates” for music therapy. Working in a setting with many contract and floating nurses, Alex also described utilizing in-services as a means of spreading awareness and knowledge about music therapy.

### ***Music Selection and Seeking Best Practices***

Interviewees spoke about their process of determining appropriate music for patients on MV. Sarah described multiple means of gathering insight for music preferences:

If there isn’t a caregiver at the bedside, I’ll call the individual’s proxy... I can look to my team, and ask that next time they call the caregiver, to ask if there are music



preferences... I somewhat go off patient demographic, too; sometimes we're going into a room blind and don't have any information, so I'm looking at race, gender, age. Calculating what music was popular when they were in their 20s... We can make some assumptions, but we also have those outliers.

Gwen, Elaine, and Vivian also echoed that they sought family first for information on patients' preferred music.

Alex took a slightly different approach to providing music for patients on MV. Citing research, Alex noted,

I primarily use guitar, and from the research we have available, trying to emulate calming, soothing music that is 50 to 65 beats per minute: being mindful of a small container of melodies and limited chord changes. I'm not doing secondary dominants here and there.

Instead of using music that was popular in the patient's 20s, Alex had "a 'setlist,' if you will; songs that are music pieces I don't sing, that are nondescript, hopefully, and do not provide any sort of association." His goal was to keep the patient "on the edge of being bored to sleep." Alex noted the songs in his setlist were arrangements of pre-existing songs that had simple melodies and chord changes that were "reminiscent of a lullaby or a nice, dreamy state." Furthermore, Alex stated, "I think it's contraindicated to show up and play *Amazing Grace*, or a well-known song, as you don't know what association this individual has, so I try to play unfamiliar, nondescript, calming, soothing music." Similarly, what Vivian discovered from talking with patients who had been extubated was that "sometimes familiar music isn't as helpful, or it can be contraindicated." She explained:

If somebody is vented, they're already in a physically fragile state and they're trying to breathe and get back to breathing on their own, that familiar music might be really emotional for them. It's probably going to interrupt that process of trying to breath, and so there's a fine line and a lot of discernment that a music therapist can offer. Whereas if you were to just leave them with recorded music playing, that may not be safe.

Interviewees also advocated for their patients and sought best practices. Sarah described a scenario in which she was working with a patient's daughter, on behalf of the mother, to determine music preferences:

[The daughter] said her mom loves Celine Dion, so we're talking through Celine Dion music, and one of the songs that came up was *All By Myself*. And it helped in the therapeutic interaction to say, 'Do you think that the song, even though your mom loves it, would be helpful for her to hear, given her circumstances?'... It helps us to be the person that bounces off the processing as to what's being played in the room, where there might not necessarily be a lyrical or musical awareness by the person providing musical selections.

Sarah also noted her role as an educator about stimulation and overstimulation for nursing and bedside staff:

It's my job to give clinical recommendations as to how long music should or shouldn't be played in a patient's room, so that we can reduce any ICU delirium... If we're bombarding our patients 24/7 with overload, they're never able to have any sort of brain rest.

## **Summary**

Of 93 board-certified music therapists who completed the entire survey, over half reported working with patients on MV, and nearly half of those respondents had five or more years of experience with this population. Five interviewees discussed the type of patient supported, interventions and related goals, family support, challenges, interactions with staff, music selection, and seeking best practices.

## **Chapter 5**

### **Discussion**

The purpose of this study was to describe how music therapists provide care for adult patients in the ICU on MV. The following section is organized by research question. This chapter will examine the results of this study in comparison to existing literature, as well as limitations of the study and recommendations for future research.

#### **Research Questions**

##### ***What interventions do MTs use with patients who are MV?***

Interviewees primarily used receptive interventions for patients on MV, including the ISO principle, breath and rhythmic entrainment, verbal diaphragmatic breathing cues, sensory grounding, music-assisted relaxation, patient-preferred live music, and use of personalized playlists. The existing literature parallels these findings: most studies also used receptive interventions such as personalized playlists (Park & Park, 2019), music-assisted relaxation (Hunter et al., 2010; Morris, 2019), live patient-preferred music (Phillips, 2007; Hunter et al. 2010; Morris, 2019), and entrainment (Phillips, 2007; Morris, 2019).

A few interviewees described using active singing experiences for patients using a tracheostomy collar. Hunter et al. (2010) was the only study reviewed that mentioned active music-making interventions for patients with a tracheostomy weaning from long-term ventilation. After a brief check-in, the music therapist utilized active interventions including singing, instrument playing, improvisation, songwriting, and song discussion, with goals of

creating positive interaction between therapist and patient, decreasing anxiety, promoting relaxation, and encouraging self-expression (Hunter et al., 2010). Patients with a tracheostomy may have a greater ability to engage in active interventions than those with invasive mechanical ventilation, since they are fully conscious when the weaning begins, and are not as physically restricted by invasive ventilation.

Goals of these interventions addressed anxiety, autonomy, cognitive stimulation, comfort and relaxation, delirium, pain, family support, psycho-emotional support, refocusing attention, self-regulation, shortness of breath, spiritual support, trauma, and validation. Reducing anxiety was the most frequently discussed goal among all interviewees. Patients on MV experience fear, pain, loneliness (Baumgarten & Poulsen, 2015; Thomas, 2003), delirium (Jeon et al., 2015; Ouimt et al., 2007), and loss of sense of control from communication issues (Logan & Jenny, 1997; Roberts et al., 2019). Existing studies examined outcomes of anxiety, agitation, biomarkers of stress and physiological arousal, pain, and delirium (Bradt & Dileo, 2014; Hetland et al., 2015; Hunter et al., 2010; Liang et al., 2016; Morris, 2019; Park & Park, 2019; Phillips, 2007). Interviewees discussed a wider range of goals than existing literature.

Interviewees discussed how they chose music for patients on MV which included a range of methods. Most interviewees sought family input first, before turning to medical staff, and then relying on patient demographics to determine preferred music. Two interviewees spoke about the potential contraindications of using well-known or preferred music, however, stating that familiar music may be emotional and therefore interrupt the process of breathing.

The literature somewhat reflects these findings. Morris (2019) assessed music preferences from family, staff, and demographics and reported using both patient-preferred and improvised, non-familiar music, based on the participants' needs. Phillips (2007) used patient-preferred music "in hopes of attaining a greater response" and briefly interviewed the family and patient, if alert, to ascertain music preferences. Hunter et al. (2010) also used patient-preferred music that was suggested by the family. All studies in Bradt and Dileo's (2014) Cochrane review used "sedative music or music that is calming." Other music medicine studies also used a mix of patient-preferred music and varieties of "relaxing" music (Golino et al., 2019; Liang et al., 2016; Park & Park, 2019; Umbrello et al., 2019).

#### ***How do MTs support the family of patients on MV?***

Interviewees supported families in various ways. Interviewees provided spiritual support, validation and normalization of medical processes, and opportunities for autonomy and reminiscence. Engaging in sessions allowed family members to feel as though they were positively contributing to the patient's care when they may otherwise feel "helpless" in the hospital environment. Interviewees noted that patients also benefitted from seeing family members engage in music interventions.

Patients on MV have reported difficulty being left alone and associated absence of family or staff with fear (Tate et al., 2012). Similarly, Baumgarten and Poulsen (2015) found that the intensity of feelings of vulnerability, fear, and anxiety depends on presence of relatives and health professionals. While studies reported that music therapy was well-received by family (Phillips, 2007) and staff (Hetland et al., 2015; Hunter et al., 2010), the reviewed literature on music and music therapy interventions for patients on MV did not include information on the presence or incorporation of family into the session.

### ***What challenges do MTs face when working with patients on MV?***

Interviewees discussed external challenges including timing and coordination with staff, communication with patients, and dealing with family dynamics. Interviewees noted the challenge of timing sessions around patients' sedation schedules and coordinating with staff for procedural support during breathing trials and extubations. As Sarah described, "There is no time frame in a medical setting." Procedures and events are not often scheduled in medical settings as staff are responding to patients' needs as they occur. The overall lack of literature on music therapy for patients on MV may reflect the challenges of timing and coordination with this population. Furthermore, communication barriers challenged interviewees since patients could not provide verbal feedback about music selections or qualities such as volume.

Internal challenges that interviewees faced were the toll of witnessing trauma, ambiguous endings, and lack of literature for evidence-based practices. Vivian noted the toll of repeatedly seeing patients in a critical state and Alex described the challenge of not knowing the extent of the impact of sessions. Skovholt and Trotter-Mathison (2016) discussed vicarious trauma, compassion fatigue, and ambiguous endings as factors that impact the therapist and the "Cycle of Caring." The Cycle of Caring summarizes the cyclical process of working with others in caring professions, beginning with the Empathetic Attachment Phase, moving to the Active Involvement Phase, then Felt Separation Phase, and finally the Re-creation Phase. Vicarious trauma refers to the effects of working with traumatized clients that shifts the therapist's inner cognitions about the world (Skovholt & Trotter-Mathison, 2016). When attempting to understand the subjective experience of the client, the therapist witnesses the painful emotions and experiences of the client. Vicarious

trauma has a more immediate onset, whereas compassion fatigue accumulates over time. Compassion fatigue results from hearing about or supporting a client who has suffered a traumatic event (Skovholt & Trotter-Mathison, 2016). Compassion fatigue makes it difficult for the therapist to regenerate and renew after engaging with clients, causing a block in the Cycle of Caring. Skovholt and Trotter-Mathison describe ambiguous endings as “endings before endings” in which the lack of closure can result in stress for the therapist. As therapists use an emotional connection to make a caring bond with the client, unexpected and unresolved endings can impair one’s ability to create bonds.

Interviewees’ statements confirm that music therapists working in healthcare settings often encounter vicarious trauma and compassion fatigue because of the nature of the work. Ambiguous endings are also common as patient turnover is high and discharge or death can be unexpected. Music therapists can and should engage in regular self-care practices to manage the effects of these stressors.

### **Limitations and Recommendations**

Results of this study should be considered with care. The themes discussed are limited to these five participants’ experiences. A larger sample size may result in a more diverse collection of experiences, therefore providing greater breadth and depth to understanding how music therapists support patients on MV. As results have identified a range of subpopulations of patients on MV, including SBTs and long-term tracheostomy weaning, future research is warranted to explore the nuances of music therapy within the spectrum of life support.

To date, while there is a plethora of music medicine literature for patients on MV, only three studies have examined music therapy for patients on MV. These existing studies

had small to moderate sample sizes ranging from 20 to 51 participants. Phillips (2007) utilized intervention and control groups, Hunter et al. (2010) used historical matched controls, and Morris (2019) did not have a control group. Randomized controlled trials with the number of participants based on a power analysis would provide breadth and depth on the impact of music therapy, music medicine, and standard care during MV and ventilator weaning.

In addition to quantitative studies, more qualitative research could examine a wider range of goals for patients on MV. Most studies examined anxiety, agitation, stress and physiological arousal, pain, and delirium, and they frequently used measures of patients' vital signs and sedatives as markers of these outcomes (Bradt & Dileo, 2014; Hetland et al., 2015; Hunter et al., 2010; Liang et al., 2016; Morris, 2019; Park & Park, 2019; Phillips, 2007). Future studies could investigate patients' perception of autonomy, psycho-emotional and spiritual support, self-regulation, and coping skills as result of music therapy during MV. Likewise, as the presence of family members seems to have a significant impact on patients' experience of MV (Baumgarten & Poulsen, 2015; Tate et al., 2012), future research could investigate outcomes of incorporating families and caregivers into sessions.

Future research is also warranted to explore patient perspectives of music therapy during MV after extubation. Music therapy was well-received by patients in all three music therapy studies (Hunter et al., 2010; Morris, 2019; Phillips, 2007). Two studies interviewed patients after extubation about their experience after a single music intervention (Almerud & Petersson, 2003; Morris, 2019). Almerud and Petersson found that patients did not recall any music; in contrast, Morris found that some patients only recalled the music when recollecting their experience on MV. Furthermore, Morris noted that while music was perceived as



“soothing,” “beautiful,” “relaxing,” and “peaceful,” some patients experienced strong emotional reactions, which may have negatively impacted the weaning process. While patient-selected music is widely cited to reduce anxiety and pain (Bradt et al., 2013b; Yinger & Gooding, 2015), results of Morris’ interviews indicate that patient-preferred music may be too emotionally evocative and therefore may be contraindicated for patients weaning from the ventilator. Patients undergoing ventilation weaning are often in an altered state of consciousness as they emerge from moderate to deep sedation. Furthermore, patients may not know where they are or why they are in the hospital, which may induce feelings of anxiety and agitation, resulting in an emotionally fragile state. Patient-preferred music may elicit strong associations or memories which could lead to an emotional reaction, impeding the weaning process. Qualitative research examining patient perspectives may provide further insight into the types and styles of music best suited for patients on MV.

### **Summary and Conclusion**

Interviewees used a wide range of receptive interventions and a few active interventions for patients on MV. Interviewees discussed a number of goals and ways in which to incorporate and support family members in sessions. Music selection was determined through insight from family, staff, patient demographics, and therapist discretion. Interviewees described external and internal challenges faced while working with patients on MV. Future research may explore music therapy interventions and goals within the spectrum of life support, effects of intentionally incorporating family into sessions, patient perspectives of music therapy during MV after extubation, and types and styles of music most appropriate for patients on MV.

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## **Appendix A**

### **Survey of Music Therapists Working in Adult Medical Settings**

Survey questions:

1. Are you currently employed as an MT-BC in an adult medical setting?
2. What is your age?
3. How many years have you been a board-certified music therapist?
4. What is your highest level of education?
5. List any specialized or advanced music therapy training you have received (ie., Neurologic Music Therapy, Bonny Method of Guided Imagery).
6. How many years have you been employed in your current position?
7. What is your geographic location?
8. In which units do you provide music therapy services for adults?
9. List any other intensive care units in which you work.
10. Do you work with patients on mechanical ventilation?
11. How frequently do you work with patients on mechanical ventilation?
12. How long have you worked with patients on mechanical ventilation?
13. Are you willing to be contacted for a brief follow-up interview regarding your work with patients in the ICU?

## **Appendix B**

### **Interview Guide**

- Describe any training you received that informs your work within the ICUs.
- Approximately how many patients do you see in the ICU each week?
- Describe the populations within the ICUs with whom you work.
- Do you provide MT services for COVID-positive patients on MV?
- Describe the intervention(s) you use for patients on MV.
- What are typical outcomes of music therapy interventions?
- How do you support the families of patients on mechanical ventilation?
- Describe your impression of ICU staff's perception of music therapy during MV.
- Do you face any challenges while providing services to those on mechanical ventilation?
- Do you have any additional comments or questions you would like to add?

## **Vita**

Macel Reising was born and raised in Annapolis, Maryland. She graduated from Washington & Jefferson College in 2018 with degrees in Education and Music. While completing her undergraduate studies, Macel volunteered at a local assisted living facility, where she discovered the field of music therapy. She entered Appalachian State University in the fall of 2018 to pursue the combined Equivalency/Master of Music Therapy degree. Macel completed her music therapy internship at the Medical University of South Carolina in Charleston, SC, and became a board-certified music therapist in 2021. Macel currently resides in Boone, NC.