

Full-Length Article

Music Preferences of Mechanically Ventilated Patients Participating in a Randomized Controlled Trial

Annie Heiderscheit^{1,2}, Stephanie J. Breckenridge², Linda L. Chlan³, Kay Savik⁴¹Master of Music Therapy program, Augsburg College, Minneapolis, MN, USA²University of Minnesota, Center for Spirituality and Healing, Minneapolis, MN, USA³College of Nursing, The Ohio State University, Columbus, OH, USA⁴University of Minnesota School of Nursing, Minneapolis, MN, USA

Abstract

Mechanical ventilation (MV) is a life-saving measure and supportive modality utilized to treat patients experiencing respiratory failure. Patients experience pain, discomfort, and anxiety as a result of being mechanically ventilated. Music listening is a non-pharmacological intervention used to manage these psychophysiological symptoms associated with mechanical ventilation. The purpose of this analysis is to examine music preferences of 107 MV patients enrolled in a randomized clinical trial that implemented a patient-directed music listening protocol to help manage the psychophysiological symptom of anxiety. Music data presented heretofore includes the music genres and instrumentation patients identified as their preferred music. Genres preferred include: classical, jazz, rock, country, and oldies. Instrumentation preferred include: piano, voice, guitar, music with nature sounds, and orchestral music. The analysis of three patients' preferred music received throughout the course of the study is illustrated to demonstrate the details and complexity involved in assessing MV patients, which substantiates the need for an ongoing assessment process.

Keywords: *music listening, mechanical ventilation, music medicine, music therapy, patient preferred music, patient controlled intervention*

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Introduction

More than 1 million persons in the US, admitted annually to intensive care units (ICU) receive mechanical ventilation [1]. Mechanical ventilation is a supportive modality that does not treat the underlying cause of respiratory failure. Patients generally are not able to wean (gradual withdrawal of mechanical support) until the underlying cause of respiratory failure resolves and the patient is ready to breathe on his or her own. It is estimated that by 2020 approximately 625,838 adults annually will require prolonged ventilatory support (> 96 hours) [2], which has significant implications for healthcare processes and costs.

To promote tolerance and synchrony with mechanical breaths, patients frequently receive many intravenous sedative and analgesic medications by continuous infusions or bolus

doses. However, the potent sedative and analgesic drug regimens these patients receive to reduce distress and oxygen consumption often result in long periods of unconsciousness. Current research in the area of sedation reduction and symptom management focuses solely on pharmacologic strategies to manage burdensome patient symptoms despite the documented deleterious effects of sedative agents [3,4]. Further, practice guidelines direct clinicians to first try non-pharmacologic strategies before pharmacological interventions to manage anxiety and distress associated with ventilatory support [5]. Effective interventions are needed to minimize mechanically ventilated patients' sedative exposure in order to reduce the incidence and severity of adverse, ICU-acquired sequelae that result from over-sedation and prolonged periods of unconsciousness and immobility, such as delirium and weakness [6].

Listening to music is a non-pharmacological intervention that can be utilized to help patients manage symptoms associated with being mechanically ventilated. Researchers have explored and investigated the use of a music listening intervention with mechanically ventilated (MV) patients as means of managing pain, discomfort, and anxiety. Researchers have found that MV patients who listened to 30 minutes of preferred music demonstrated a significant decrease in state anxiety [5,6]. Some research has shown that listening to music significantly decreases physiological measures associated with anxiety such as, heart rate, systolic and diastolic blood pressure, and respiratory rates [7,8].

PRODUCTION NOTES: Address correspondence to:

Annie Heiderscheit, Ph.D., MT-BC, LMFT, Director of Master of Music Therapy and Assistant Professor, Augsburg College, 2211 Riverside Avenue, Minneapolis, MN 55454. Email: heidersc@augsborg.edu | COI statement: The authors declared that no financial support was given for the writing of this article. The authors have no conflict of interest to declare.

A Cochrane Review on the use of music interventions with MV patients was recently published and included 8 randomized and quasi-randomized controlled trials, of 213 patients. These studies suggest that a music listening intervention is a viable intervention for managing stress and anxiety that may positively impact heart rate, respiratory rate, and anxiety in MV patients. While the research does conclusively support the use of music listening as an effective intervention, the authors suggest that additional research is needed to further explore and understand the effects of music listening with MV patients. Additionally the review recommends that these interventions be facilitated and provided by a trained or board certified music therapist [9].

Music preferences for music listening protocols

Research surrounding the use of music listening is abundant in the literature however studies often tend to focus on the effect of the music, providing limited detail regarding the actual music utilized in the study [10,11]. In some cases the music may simply be referred to as ‘relaxing’, ‘easy listening’, ‘environmental’, ‘modern music’ or ‘patient selected’ with no further descriptors about the music [12-16].

In the majority of studies, researchers provide a set selection of music from which patients chose music to listen to during procedures. For example, in one case study, researchers utilizing music listening during chest tube removal provided a library of ten cassettes tapes with music from ten different genres. Patients most often selected music from the following genres: classical, country or easy listening [17]. Research for preoperative patients demonstrated that they primarily selected classical, jazz, country & western, new age or easy listening music; however the music in those categories were recorded by primarily contemporary artists [10,13,14,18,19].

Some discussion exists in the literature as to whether or not patient preference is important or influential in music listening protocols to outcomes. In 1 of these studies patients neglected to bring their preferred music from home to listen to during their procedure, so there was no true comparison between research-selected or patient-selected music [18,20]. Researchers in 2 recent studies found that outcomes were not significantly different between patients who listened to researcher-selected and patient-selected music. However, one study had a limited sample size, including 60 participants, a majority of whom were from a specific patient population (African American females making less than \$20,000 per year). The second meta-analysis found that music ‘based on research’ was more effective than music based on ‘participant preference’ [21]. However, the meta-analysis did not evaluate the effectiveness of patient preferred music that also conforms to research based guidelines of 60-80 beats per minute.

In the ongoing discussion about patient-preferred music, a number of studies including the recent meta-analysis, do note that music must be tailored appropriately to individual preferences to realize the greatest benefit from the

intervention [7,8,22-24,26]. These studies emphasize the importance of personal history [22,23], association or familiarity [13,22-24], and musical experience to the chosen music [25]. In order to take into consideration personal history, association, familiarity, musical experience and tailor individual preferences a music preference assessment is necessary [23,24,26].

Research with MV patients have included the use of the following music: *Music Tx* designed by Dr. Helen Bonny and classical music [7,8,19] and in a recent review of the use of music with MV patients it was reported that the majority of studies use various categories of relaxing music [21]. Researchers in case illustrations have also described 2 cases from a randomized controlled trial utilizing a patient-directed music listening intervention. These 2 case illustrations provide greater detail regarding the process of assessing a MV patient’s preferred music, the successful implementation of a music listening intervention, and a description of how the intervention can be individualized based on patient needs. The patients in these illustrations preferred classical, jazz, oldies, classic rock, country, and rhythm and blues [23].

The secondary analysis that follows provides information and direction regarding music preferences and music selection for clinicians and researchers developing and instituting music listening interventions with mechanically ventilated patients or other patient populations. This analysis reflects the wide variety of music preferences and the types of music requested by mechanically ventilated patients that we encountered throughout the course of this study.

Method

Overview of the Main Parent Study

Our data presents the results of a secondary analysis from a parent study for which the primary aim was to determine whether a patient directed music intervention was effective in reducing anxiety throughout the course of mechanical ventilatory support. Patients had to be alert, making their own care decision, and interacting appropriately with the ICU nursing staff to be eligible for the study. The parent study utilized a three group randomized clinical trial to address its primary aim¹. Patients receiving mechanical ventilatory support in 1 of 12 participating ICUs in the Minneapolis-St. Paul area were randomized to: 1) patient-directed music (PDM), where patients listened to preferred music through headphones whenever desired for as long as desired each day while receiving ventilator support, 2) active control conditions

¹ Chlan, L., Weinert, C., Heiderscheit, A., Tracy, MF, Skaar, D., Guttormson, J., Savik, K. (2013). Effects of patient directed music intervention on anxiety and sedative exposure in critically ill patients receiving mechanical ventilatory support. *JAMA: Journal of the American Medical Association*. Published online May 20, 2013. 309(22); doi:10.1001/jama.2013.5670

of headphones only, where patients were free to wear noise-canceling headphones whenever desired for as long as desired to block out ICU noise, or 3) control group of usual ICU nursing care for each respective unit. Additional details and findings from the parent study are available elsewhere [23,24,26].

The use of a patient directed music protocol with patient preferred music for this study allowed patients to choose the music they wanted and how much music they wanted. This generated and provided a significant amount of music data. To explore the music data for this study a secondary analysis was needed. For this secondary analysis, a descriptive design was utilized to illustrate and discuss music preferences of the PDM group. The scope, depth, and patterns of these preferences is outlined in this descriptive data.

Music Preference and Implementation of the Music Listening Protocol

The music listening protocol supervised by a board certified music therapist incorporated patient-preferred music that was 60-80 beats per minute. The patient-directed protocol allowed patients the power to choose their preferred music, as well as how much music they wanted and how long they wanted to listen. The music therapist assessed music preferences of each patient in the music listening group, instructed patients on how to operate the MP3 player, and also ensured the proper operation of the music equipment.

When a new patient was randomized to the music group, he/she was given an MP3 player and a starter set of five compact discs of relaxing music with various instruments including guitar, harp, Native American flute, piano, and guitar and flute. These CDs were selected utilizing music between 60-80 beats per minute and because they provided a variety of instrumentation to allow for patient preferences. The five CDs that were utilized in the starter set were purchased from the Target *Lifescape*TM series. This CD starter set allowed patients to begin listening to music immediately. The music therapist would then complete a music preference assessment within 24 hours of enrollment in the study.

The Music Assessment Tool (MAT) (in *Appendix A*) developed by Chlan and Heiderscheit was utilized to assess patient music preferences [18]. While patients who are mechanically ventilated are typically unable to speak, this required the music therapist to gather information regarding their preferences in numerous and various ways. This included reading lips as patients mouthed words and confirming what they had mouthed, patients writing down their preferences, as well as, talking with family members, loved ones or caregivers and clarifying accuracy with patients. Use of the MAT allowed the music therapist to collect consistent information throughout the study and ensured treatment fidelity. Patients in the PDM group selected music from 15 different genres using the MAT form [24]. The genres on the MAT form included [24]: classical, religious/sacred, rock, rhythm & blues, country, hip hop, reggae, jazz, rap, new

age, world music, alternative, heavy metal, oldies (1950-1970), pop music, and other. The music genre categories were limited to these 15 broad categories in order to ascertain music preferences quickly and efficiently and as to not tax the patient. From these 15 categories patients could also provide information about specific groups or artists they preferred and they could specify other music genres, groups, or artists they preferred as well.

After identifying patients' music preferences with the MAT form, the music therapist created compact discs for the patient that included music from the genres, music groups, and artists that the patient preferred. To comply with copyright laws, all music was purchased in CDs or in downloadable format. The music was uploaded into *iTunes* on designated research computer. The music therapist would determine which pieces of music and songs were within the 60-80 beats per minute and those pieces were included on the playlists and burned onto the CDs that were distributed to patients in the music group. These CDs were delivered to the patient the following day and the music therapist would continue to daily assess the patient's music preferences and provide CDs of that music as requested. Information regarding preferences was gathered throughout a patient's enrollment in the study in order to provide a full scope of music that was representative of the patient's preferences. There was no limit to the amount of music provided to a patient. Additionally, patients could select music from any genre, music group, or artist at any time during enrollment, regardless of previous selections. The music therapist would then be responsible for finding music from those genres, groups, or artists that fit within the protocol of being 60-80 beats per minute.

The music therapist met with PDM patients daily throughout their enrollment in the study to provide for opportunities to request additional music and ongoing support for implementing the PDM protocol. Mechanically ventilated patients are often tired, weak, and struggle to communicate. Therefore it was important to recognize that patients could not recall or communicate all of their preferences in one visit. This warranted utilizing an ongoing assessment process and gathering information during each encounter with the patient [17]. When patients were unable to communicate, family members were consulted to provide information regarding the patient's music preferences.

Data Analysis

Patients' preferred music selections were identified and labeled by genre and primary instrument. Music genres were defined by the categories on the MAT form; primary instrument was identified as the salient instrumental sound or sounds in the music. Music preferences of patients in the PDM group with the longest study enrollments were also compared.

Correlation between number of days enrolled and number of CDs distributed by subject was determined using Spearman’s Rho (2-tailed) due to the skewed distributions of both number of CDs and days enrolled. Chi-square test of association was used to compare genre preferences by gender. When comparing music preferences between genres, each genre was recorded as either listened to or did not listen to music from this genre for each patient in the music group. Average age was compared between those who did and did not listen to specific genres using an independent t-test. Analysis was performed using SPSS v.20. Results were considered significant at $p < .05$.

Results

A total of 373 participants were enrolled in the parent study. 126 of these were randomized to the PDM group, which is the focus of this secondary study. Patients in the PDM group had a mean age of 60.4 years (± 15.4) with a wide age range of 23-91 years; 54% were female. Prior to study entry, PDM patients had been in the ICU for a median of 6 days (range 0-40) and had been receiving ventilatory support for a median of 4.5 days (range 0-35). PDM patients were enrolled and maintained on protocol for a median of 3.1 (range 1-28) days. Median total ICU days for the PDM group was 15.2 (range 1-53 days). PDM patients listened to music a median of 63.8 (range 0-580) minutes/day. All Subjects were Caucasian except for one Hispanic subject.

Music data exists for 107 of the 126 subjects in the PDM group. Missing music data was primarily due to short enrollment times in the study, compounded by patients’ inability to identify music preferences as a result of sleep or fatigue. Of the 107 participants for whom music data exists, 59 were female and 48 were male.

1,580 CDs were distributed to patients in the PDM group and over the course of 44 months for this study. The median number of CDs distributed per subject during study enrollment was 13 CDs (range 0-56). It is important to note that this number does not include the five CDs in the starter set. Patients were able to continue to use and listen to CDs from the starter set throughout the study as well if they chose to. The number of CDs each patient received was correlated with length of study enrollment ($\rho = .36$). This correlation indicates that patients experiencing a longer study enrollment time, continued to request additional CDs, which provided a greater selection for listening (Figure 1).

The data demonstrate a wide variety in music selections. Based on patients’ music requests, the 15 broad genre categories of the MAT form were slightly rearranged and augmented for analysis. Specifically, the genres alternative and hard rock were grouped under the larger genre category of rock and the category of blues was created since this was genre that patients requested under the previous genre other. The oldies genre was expanded to include the 1940s decade, since a number of patients requested music specifically from that era. This left 14 broad categories.

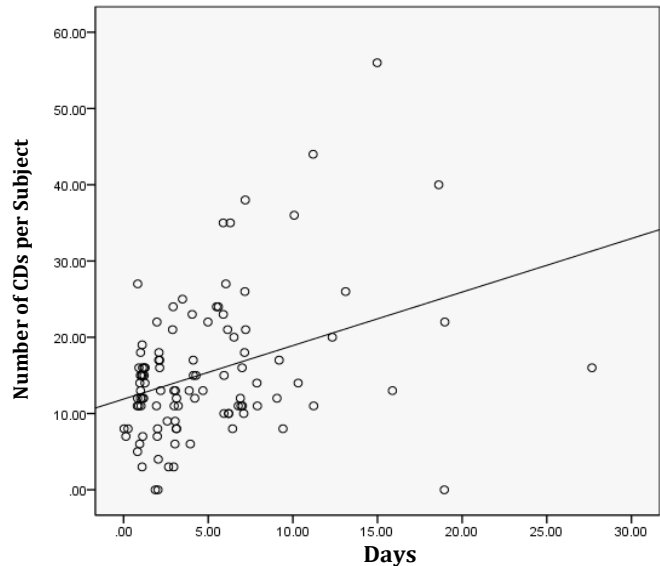


Figure 1. Correlation between days enrolled in study and number of CDs distributed

Despite the variety in music genres selected by patients in this study, preferences can be discerned. Classical music was the most commonly requested and distributed genre; this includes classical music with and without accompanying environmental or nature sounds such as water, bird songs, or wind. Country, religious or sacred music, and jazz were also commonly requested music genres, and in total 120 CDs from these genres were distributed to patients. Figure 2 depicts genre selections for all patients during the course of the study.

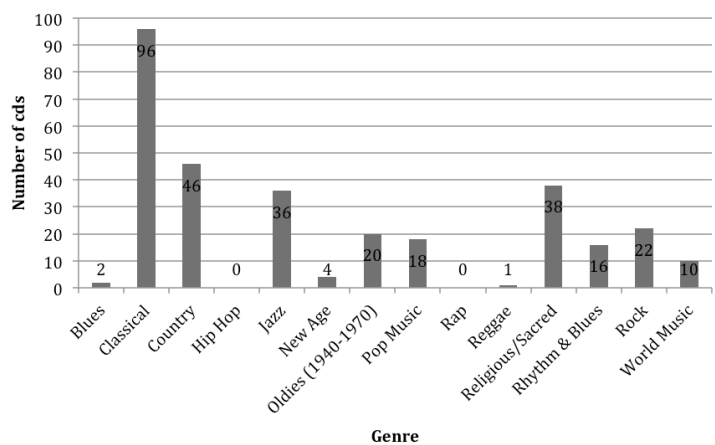


Figure 2. Distributed CD genres; Additionally, “Holiday” music was delivered 4 times to patients who requested it during the Christmas holiday season.

Patients selected music that consisted of at least 25 different primary instrumental sounds. As *Figure 3* illustrates, patients most frequently requested music with prominent instrumental sounds of piano, voice, and guitar.

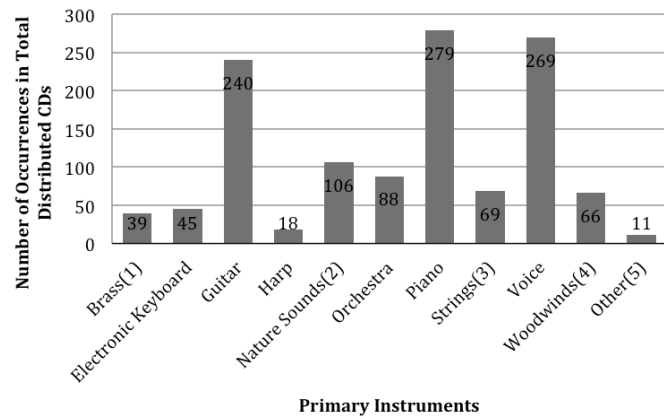


Figure 3. Primary instruments in distributed CDs; (1)Brass includes solo trumpet; (2) Nature sounds =birds, loon, ocean waves, rain sounds, water sounds, and combinations of these sounds; (3) Strings includes solo cello; (4) Woodwinds includes saxophone, classical flute, Native American flute, Celtic flute; (5) Other=accordion, drum, steel drum, and ukulele

Their choices over time reveal that piano, voice, and guitar were the most common primary instrumental sounds in almost all of the CDs delivered (*Table 1*). There were few genre preference differences between participants of varying

genders and ages. The only significant difference between genders was jazz, which men preferred significantly more frequently than women (*Table 2*).

Genre	Male (n=48) N(%)	Female (n=59) N(%)	p-value
Blues	16(33%)	14(24%)	.27
Reggae	1(2%)	1(2%)	NA
Classical	36(75%)	45(76%)	.88
Country	19(40%)	21(36%)	.67
Jazz	36(75%)	32(47%)	.03
Hip Hop	0	0	NA
New age	14(29%)	12(20%)	.29
Oldies (1940-1970)	21(44%)	22(37%)	.50
Pop Music	6(13%)	13(22%)	.20
Rhythm & Blues	14(29%)	15(25%)	.67
Religious/Sacred	9(19%)	11(19%)	.99
Rap	0	0	NA
Rock	21(44%)	17(29%)	.11
World Music	10(21%)	10(17%)	.61

Table 2. Genre (ever listen to) compared by gender

Similarly, there were surprisingly few significant differences between the average ages of those who did and did not listen to specific genres. Those who listened to rock were significantly younger than those who did not. Those who listened to oldies were significantly older than those who did

CD Delivery	Brass ¹	Electronic Keyboard	Guitar	Harp	Nature Sounds ²	Orchestral	Piano	Strings ³	Voice	Woodwinds ⁴	Other ⁵
First	15	16	74	9	45	36	95	33	94	34	1
Second	13	12	70	4	19	24	76	12	74	20	1
Third	6	5	33	2	12	14	39	7	40	9	2
Fourth	2	3	23	0	7	5	23	7	21	6	0
Fifth	2	3	13	1	4	3	13	1	13	6	1
Sixth	1	1	10	0	5	3	10	2	10	0	0
Seventh	0	1	3	1	3	2	6	2	4	0	1
Eighth	0	0	4	0	10	0	6	1	3	0	0
Ninth	0	0	1	0	2	1	4	3	3	0	1
Tenth	0	1	3	0	0	0	3	0	4	0	1
Eleventh	0	0	1	1	0	0	1	0	1	0	0
Twelfth	0	1	2	0	0	0	1	0	1	0	1
Thirteenth	0	1	2	0	0	0	0	0	1	0	1
Fourteenth	0	1	0	0	0	0	1	0	0	0	0
Fifteenth	0	0	0	0	0	0	0	1	0	0	1
Sixteenth	0	0	1	0	0	0	1	0	0	0	0

Table 1. Primary instruments in each CD delivery; (1) Brass includes solo trumpet; (2) Nature sounds =birds, loon, ocean waves, rain sounds, water sounds, and combinations of these sounds; (3) Strings includes solo cello; (4) Woodwinds includes saxophone, classical flute, Native American flute, Celtic flute; (5) Other=accordion, drum, steel drum, and ukulele

not. The genres of blues and R&B were very close to significance, with those who listened typically being younger than those who did not (Table 3).

other participant in the music group. Patient Q requested and received classical, new age, jazz, pop, and world music. However, 45 of the 56 CDs that Patient Q received included classical music, with the other genres included throughout this patient’s sixteen CD deliveries. This illustrates Patient Q’s preference and request for a broad range of classical music.

Discussion

Music data collected in this study clearly demonstrate the breadth of musical genres and instrumental sounds that patients chose when given open opportunity to select their preferred music. Although patterns in participants’ music choices can be observed as a group, it is important to note that factors such as gender, age, race or ethnic heritage, and personal experiences may impact patients’ individual music preferences [12,15,23,27-30]. These individual differences may influence how effective a music listening intervention is for particular patients [11,31].

In this study, few significant differences in music preference were noted with regard to age. However, the age of patients receiving mechanical ventilatory support can range greatly, as it did in this study (25-93 years). Individual music preferences may also vary greatly, and making assumptions about preferences based on age may be misleading [23]. For instance, although those who listened to oldies in this study were significantly older than those who did not, it is not safe to assume that elderly patients prefer oldies, or that young people do not prefer to listen to oldies.

With regard to race, only one subject was not Caucasian, which reflected the demographic makeup of the region in which the study was conducted [32]. It is not surprising, then, that the genre world music, which included Native American, Caribbean, Celtic, French, Hawaiian, Italian, and Spanish music, represented just 3% of all music selections in this study (Figure 2). Race and ethnic heritage are factors known to influence music preferences [33-38]. Geographic regions with more diverse populations may have patients with more diverse music preferences than those found in this study.

Minimal differences were observed with regard to music preferences and gender in this study. However, other studies have demonstrated that gender differences may be more pronounced [39,40]. Furthermore, all of the patients with longest enrollment in this study, Patients F, M, N, and Q, were male. Music preferences for female patients may differ more over time. As with age, clinicians should not make assumptions about music preference based on gender because such assumptions may be misleading.

The number of CDs requested and received by patients each day was affected by such variables as patient health, which impacted what music preferences they were able to identify and request. For instance, on some days patients were sleeping when the music therapist visited. Other patients presented as too fatigued to discuss new music preferences when the music therapist visited, requesting to listen to music during the visit instead. Specific music preferences and needs

Genre	Did not listen Mean age (SD)	Listened Mean Age (SD)	p-value
Blues	63.0(14.7)	53.6(15.0)	.004
Reggae	60.5(15.3)	53.0(18.4)	.49
Classical	57.0(16.2)	61.5(15.0)	.49
Country	61.2(15.7)	59.1(14.7)	.50
Jazz	56.7(15.5)	62.5(14.9)	.06
Hip Hop	0	0	NA
New age	60.6(14.9)	59.9(17.0)	.84
Oldies (1940-1970)	56.1(14.6)	66.7(14.3)	<.001
Pop Music	61.3(14.7)	56.4(18.0)	.22
Rhythm & Blues	63.0(15.2)	53.5(13.7)	.004
Religious/Sacred	60.2(14.5)	61.5(18.8)	.77
Rap	0	0	NA
Rock	65.0(13.8)	52.0(14.5)	<.001
World Music	60.6(16.0)	59.4(12.0)	.75

Table 3. Genre compared by age

An in depth examination of 3 patients with the longest study enrollment, demonstrate that genre and instrumental preferences tended to remain stable over time. Additionally, these examples further illustrate that patients often continued to request music throughout the course of their enrollment. This could be the result of their impaired ability to recall information due the stress and anxiety of being in the ICU as well as sedation.

Patient F, age 53, was enrolled for 28 days, the longest enrollment in the PDM group. Patient F chose only classic rock and country music. Patient N, age 72 and enrolled 19 days, primarily received classic country music and oldies. Patient N’s only genre variation occurred on the second and third CD deliveries, when Patient N also requested classical and big band music.

Patient M, age 34 and enrolled for 19 days, exhibited the greatest variation of the three longest enrolled patients. Patient M requested many sub-genres of jazz and classical music, as well as contemporary Christian, R&B, blues, and classic rock. Most of the variation in Patient M’s music requests occurred in the early part of study enrollment. Beginning with the third CD delivery and remaining consistent through the eighth and final delivery, Patient M requested and received only jazz or contemporary Christian music.

Stability in music selection appears to be similarly true of patients who received greater numbers of CDs during their study enrollment, regardless of the number of days of enrollment. An example of this is Patient Q, age 56 and enrolled over 15 days, who received more music than any

can be affected by emotional state [41]; therefore utilizing an ongoing assessment process is important.

While the data illustrates the music preferred, requested by and provided to the patient, it does not demonstrate which CDs the patients listened to throughout the course of the study. Since this was a patient directed music protocol patients could listen to their selected music whenever they chose to. While the data recorder on the MP3 player could record when and how long a patient listened to music, data regarding the specific CD, genre, artist or group could not be delineated. Due to patients fragile state, patients were not asked to recall what music they listened to and due to the busy nature of the ICU environment, researchers did not ask nurses to gather this data.

While research regarding the use of patient selected music has demonstrated mixed results this may be due to limited selections being provided to patients [15,27,41]. Research does demonstrate that utilizing patient preferred music can significantly reduce anxiety, decrease sedation, and facilitate relaxation [10,11,15,19,21,28]. Assessing patient music preferences requires a specific skill set and the consideration of the variety of factors that impact music preferences [23,24]. Assessing patient's individual music preferences allows the clinician or researcher to determine the music the patient prefers in light of individual differences such as age, gender, race or ethnic background, and particular experiences and circumstances, rather than limiting or restricting listening choices and options. Therefore, in this study, the music therapist played a crucial role in determining patients' preferred music each day, as well as maintaining patients' ability to listen to their preferred music. The music therapist provided a consistent assessment process for each patient, ensured that subjects were able to operate the MP3 player and were informed of the music delivered, and that the equipment was functioning properly.

The task of assessing critically ill and mechanically ventilated patients was difficult due to their limited ability to communicate, as a result of being intubated. Ascertaining information and music preferences from a patient was done by reading lips, asking questions to allow a patient to respond with only head nods, asking the patient to write down information, or talking with family members or loved ones. Attending to each of these tasks was vital to ensure that the experimental protocol was implemented consistently for each patient throughout the course of the study. This also provided treatment fidelity for the PDM group.

Most intensive care units are not likely to have a music therapist on staff nor do they have access to a music therapist. While the role of the music therapist was crucial for this study, it is feasible to implement a music listening protocol without the presence of a music therapist. Nursing staff can work to communicate with the patient or family to determine what music the patient prefers. It may be helpful to utilize an assessment tool such as the MAT [24]. This tool provides an overview of music genres and instrumentation to help determine what patients preferences, without taxing them

with unnecessary questions. It is also helpful for caregivers to identify specific artists or music groups in the assessment process, as patients may not like some artists or groups, even within their preferred genre(s). For example, a patient may prefer country music, but may not like Garth Brooks, or may only like classic country singers such as Merle Haggard and Loretta Lynn. Identifying specific artists or music groups helps to clearly delineate patients' listening preferences, with more effective results [9]. In the event the patient is not able to effectively communicate his or her preferences, conversing with family members or loved ones to determine the patient's music preferences may be helpful. In some instances, family members may be able to bring in music that the patient already owns as a part of his or her personal music collection.

Conclusion

Mechanical ventilation is a supportive modality for patients experiencing respiratory failure. Patients experience pain, discomfort, and anxiety as a result of being MV. Music listening is a non-pharmacological intervention that can be utilized to help manage the psychophysiological symptoms associated with MV. While music can be a useful intervention, assessing and determining the patients' individual and specific music preferences is a vital component to the effectiveness of the intervention. The wide variety of music preferences among study participants illustrates the necessity for assessment prior to initiating a music listening intervention in order to maximize patient benefit. Additionally, due to the critical status of a MV patient's health, it is important to complete the assessment of music preferences in a thorough yet concise manner, recognizing that this information may need to be obtained in an ongoing fashion in order to maximize the intervention benefits for the patient. This supports the significant role of the board certified music therapist to not only assess patient music preferences, but to implement the music listening intervention.

The role of the music therapist in this study ensured that the broad scope of patient music preferences were accurately and fully assessed. A music therapist's specialized training regarding music, music genres, utilizing and applying music therapeutically to best meet patient needs, as well as their knowledge of specialized patient care were key to the successful implementation of the music listening protocol. The breadth and depth of the music that patients requested illustrates their desire for their preferred music and furthermore that preferred music has an extensive scope and cannot simply be reduced to several CDs made available for patients to choose from. The data from this study demonstrates that patients continued to request and receive their preferred music throughout the course of the study, as they continued to identify a variety of selected music that they preferred to utilize. A music therapist's involvement in the study ensured that they had the variety of music they wanted and needed to maximize the effectiveness of the music listening intervention.

This patient controlled intervention allowed patient's to identify and request their preferred music without limitations, except for using music between 60-80 beats per minute. This freedom of complete choice provides patients a sense of being empowered in their own care. At a time when they ventilated, feeling overwhelmed and powerless, a patient directed music listening protocol under the prescriptive care of a board certified music therapist allowed patients to make decisions daily about what, when and how long they wanted to listen to music. This type of carefully designed and administered patient-directed protocol provides opportunities for patients to be empowered in their care on a daily basis and afforded the opportunity of an aesthetically pleasing environment amidst the often traumatic environment of an ICU.

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Biographical Statements

Dr. Heiderscheid is the Director of the Master of Music Therapy program and assistant professor Augsburg College, Minneapolis, MN.

Stephanie Breckenridge was the Smaby Research Assistant for the Arts and Healing Program, Center for Spirituality and Healing, Academic Health Center, University of Minnesota.

Dr. Chlan is a tenured faculty member in the College of Nursing, The Ohio State University.

Ms. Savik is a biostatistician in the School of Nursing at the University of Minnesota.

Appendix A - MUSIC ASSESSMENT TOOL (MAT)

Background Information:

Patient Name: _____
Date: _____
Diagnosis: _____
Age: _____
Education: _____
Vocation: _____
Ethnic background: _____
Religion/Faith practice: _____

Date of ICU admission: _____

Reason for admission:

Significant events prior to admission:

Current mood state:

Any hearing impairment? Please specify: _____

PART I: Patient Music Assessment

1. Do you like to listen to music? Yes No

2. Do you play an instrument(s)? Yes No
If yes, what do you play?

3. Are you a professional musician? Yes No

4. Are you a hobbyist musician? Yes No

5. When do you like to listen to music? (Check all that apply)

<input type="checkbox"/> Relaxation	<input type="checkbox"/> Stress reduction	<input type="checkbox"/> During meals
<input type="checkbox"/> Pure enjoyment	<input type="checkbox"/> To pass time	<input type="checkbox"/> W/ family/friends
<input type="checkbox"/> During exercise	<input type="checkbox"/> For prayer	<input type="checkbox"/> During work

Other _____

6. What types of music do you enjoy? (Check all that apply)

<input type="checkbox"/> Classical	<input type="checkbox"/> Religious/Sacred	<input type="checkbox"/> Rock
<input type="checkbox"/> Rhythm & Blues	<input type="checkbox"/> Country	<input type="checkbox"/> Hip Hop
<input type="checkbox"/> Reggae	<input type="checkbox"/> Jazz	<input type="checkbox"/> Rap
<input type="checkbox"/> New Age	<input type="checkbox"/> World Music	<input type="checkbox"/> Alternative
<input type="checkbox"/> Heavy Metal	<input type="checkbox"/> Oldies (1950-1970)	<input type="checkbox"/> Pop music

Other _____

7. Any particular group(s) and/or artist(s) you prefer?

8. What instruments or instrumental sounds do you like? (Check all that apply)

<input type="checkbox"/> Orchestral	<input type="checkbox"/> Harp	<input type="checkbox"/> Classical guitar
<input type="checkbox"/> Vocal	<input type="checkbox"/> Flute	<input type="checkbox"/> Folk guitar
<input type="checkbox"/> Piano	<input type="checkbox"/> Saxophone	<input type="checkbox"/> Percussion/drumming
<input type="checkbox"/> Brass or horns	<input type="checkbox"/> Clarinet	<input type="checkbox"/> World instruments
<input type="checkbox"/> Oboe	<input type="checkbox"/> Ocean waves	<input type="checkbox"/> Environmental sounds

Other: _____

9. Are there any types of music that you DO NOT like?

10. Are there any groups or artists you DO NOT like?

11. Are there any instruments or instrumental sounds that you DO NOT like?

12. Are there any cultural considerations or is culture an important aspect to your music selection?

13. Any other information you would like to share or that you feel I should know?

Comments and observations: _____

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