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Abstract

Practice Problem: The practice problem is anxiety related to hospitalization among adults in an acute care setting. Increased anxiety can lead to other issues while hospitalized including disruptive behaviors.

PICOT: The PICOT question that guided this project was: In hospitalized medical-surgical adults (P), how does the implementation of a music intervention as an adjunct to standard distraction techniques (I) compared to standard care (C) affect symptoms of anxiety as observed by the rate of behavior de-escalation team calls (O) within eight weeks (T)?

Evidence: There were five systematic reviews, four systematic reviews with meta-analysis with high level of evidence, high quality rating, and high quantity of articles included emerged that led to the project. Evidence supported the use of a music intervention for therapeutic distraction and reduction of anxiety.

Intervention: The intervention was a music intervention of a personalized music selection for approximately 30 minutes prior to procedures or when anxiety or disruptive behavior was noted in addition to standard care.

Outcome: Music intervention use increased by 68 individual sessions during the intervention period from baseline. Utilization of the de-escalation team decreased 80% from the preceding 10 weeks prior to implementation. Data collection difficulties reduced observation of knowledge change, however, activities related to the intervention increased during the intervention period.

Conclusion: The use of music as an intervention to decreasing anxiety and the use of a de-escalation team for disruptive behavior was successful though the process outcomes were not met. Staff engagement will be key in making this a sustainable practice and additional interventions for staff engagement are necessary.

Addressing Anxiety in Hospitalized Adults Using a Music Intervention

Healthcare settings are high paced environments that can be stressful to patients. There are many types of conditions that can also lead to a heightened stress level for a patient. Some of these conditions could include invasive procedures, heart conditions, cancers, and other debilitating conditions. Cancer is a life-threatening disease that can cause emotional and physical distress to millions of individuals annually (Zhang et al., 2012). It has been reported that up to seventy-five percent of surgical patients experience pre-procedure anxiety (Kuhlmann et al., 2018). It has also been found that music is effective in multiple specialty care areas of hospitals including critical care, acute, pre-operative, cardiac, and hospice care units (Evans, 2001). The purpose of this project is to evaluate and implement a sustainable music intervention to decreasing anxiety in hospitalized adult patients.

Significance of the Practice Problem

The practice problem is anxiety related to hospitalization among adults in an acute care setting. Oxford Lexico (2021) defines anxiety as "a feeling of worry, nervousness, or unease, typically about an imminent event of something with an uncertain outcome," (Definition 1). Anxiety is the body's warning system to potentially dangerous situation (Hoehn-Saric et al., 2000). The autonomic stimulation of the sympathetic and parasympathetic nervous systems causes an increase in heart rate, blood pressure, respiration, sweat gland activity, and gastrointestinal and bladder activity. It can cause feelings of apprehension or dread, tense or jumpy, restlessness or irritability, anticipating the worst (National Alliance for Mental Illness, 2021).

This is important because hospitalized patients are often exposed to a large array of physiological and psychological stressors that can lead to anxiety. Longer hospitalizations and

repeated procedures can lead to anxiety disorders as the anxiety becomes more unmanageable and overwhelming. Dattani et al. (2017) found that 284 million people worldwide experienced an anxiety disorder in 2017. Mental Health America (2021) found that 42.5 million US adults have anxiety disorders. Anxiety & Depression Association of America (2021) noted that people with anxiety disorders (AD) were six times more likely to be hospitalized for psychiatric disorders than people without AD. People with an AD were 56% more likely be a frequent user of medical services. (Devane, 2005). 10% of frequent users with anxiety account for 48% of days spent in a hospital.

Anxiety is associated with decreased work productivity, impaired work, family, and social functioning, physical disability, and mortality; even mild anxiety is associated with significantly greater impairment in quality of life than no anxiety at all (Brenes, 2007). Related factors to anxiety in a hospitalized patient include major change in health status, family history of anxiety, threat of death, unmet needs, and knowledge deficit (Gianfranco et. al., 2018). Estimated cost of anxiety is between $42.3 billion and $46.6 billion (DeVane, 2005). The organization does not routinely measure or benchmark anxiety among acute care patients or any patients directly. However, increased anxiety can lead to other issues while hospitalized including disruptive behaviors. Disruptive behaviors were routinely recorded at the facility. Disruptive behaviors among identified patients for this intervention was an outcome measure to track effectiveness of the implementation.

PICOT Question

Gianfranco et al. (2018) discussed that related factors to anxiety in a hospitalized patient include major change in health status, family history of anxiety, threat of death, unmet needs, and knowledge deficit. The PICOT question is as follows: In hospitalized medical-surgical adults

(P), how does the implementation of a music intervention as an adjunct to standard distraction techniques (I) compared to standard care (C) affect symptoms of anxiety as observed by the rate of behavior de-escalation team calls (O) within ten weeks (T)? The population was hospitalized adults in a medical-surgical setting. The project was implemented as a pilot on one medical-surgical unit. The pilot unit cared primarily for oncology patients though all the medical-surgical units receive overflow patients when necessary. This meant that the patients on the unit with a variety of primary diagnoses. The intervention was a music intervention of a personalized music selection for approximately 30 minutes prior to procedures or when anxiety or disruptive behavior was noted in addition to standard care. The facility uses an electronic patient television/ education system that has a music app available for patient use. However, the app was not used routinely or monitored for its usefulness in addressing anxiety and agitation. The comparison group was standard care. The outcome measure was the use of the facility de-escalation team for assistance with patients experiencing disruptive behavior. The total facility usage for fiscal year 2020 was ninety-eight team activations. For the medical-surgical units, there were 55 de-escalation team activations. On the pilot unit, there were eleven team activations which was the second highest number of calls on a medical-surgical unit. The medical-surgical unit with the highest number of de-escalation team activations had 12 activations. The project implementation spanned ten weeks. This project was identified by review of usage of the behavioral de-escalation team. Prior to this project there was a decrease in behavioral de-escalation techniques training at the facility related to COVID-19 precautions. The format of the training required by the facility is face-to-face for part 2 and part 3. The first level is an online format. Since March 2020, the face-to-face classes have been suspended leading to 67% of staff being delinquent or having never completed part 2 and 73% for part 3. The goal of this project was to educate the

staff on and give them access to an additional de-escalation technique that can be used for disruptive behavior and anxiety.

Evidence-Based Practice Framework & Change Theory

EBP Model

The John Hopkins Nursing Evidence-Based Practice (JHNEBP) conceptual model is the EBP model that was used for the intervention implementation project. The JHNEBP defines a system of decision making that has steps of inquiry, practice question, evidence, translation (PET), best practice, and practice improvement (Dang & Dearholt, 2017). The PET section of the JHNEBP has nineteen steps that were divided into three sections: practice question, evidence, and translation. The first section is practice question and includes six steps: recruit interprofessional team, define the problem, develop, and refine the EBP question, identify stakeholders, determine responsibility for project leadership, and schedule team meetings. The second part is evidence and includes the following steps: conduct internal and external search for evidence, appraise the level and quality of each piece of evidence, summarize the individual evidence, synthesize overall strength and quality of evidence, develop recommendations for change based on evidence synthesis. The last section of the PET is translation and incorporates determine fit, feasibility, and appropriateness of recommendation(s) for translation path, create action plan, secure support, and resources to implement action plan, implement action plan, evaluate outcomes, report outcomes to stakeholders, identify next steps, disseminate findings. The PET section was the primary focus of this implementation pilot.

Change Theory

The change theory used for this project was the Kotter 8-Step Process for Leading Change. Kotter's change management theory was published in 1995 and was instantaneously

successful. It is identified as one of the most recognized models for organizational transformation (Pollack & Pollack, 2015). The initial publication was based on his personal experiences and didn't reference other works (Appelbaum et al., 2012). ''Kotter's change management model appears to derive its popularity more from its direct and usable format than from any scientific consensus on the results'' (Appelbaum et al., 2012, p. 764). The change theory has 8 steps: create a sense of urgency, build a guiding coalition, form a strategic vision and initiatives, enlist a volunteer army, enable action by removing barriers, generate short-term wins, sustain acceleration, and institute change (Kotter, n.d.). This model fits the proposed intervention well. It provided the foundation for implementing the organizational change.

Evidence Search Strategy

The search was conducted using three databases including CINAHL, OVID Medline, and PubMed. On CINAHL, the key terms used were (music) AND (anxiety) with initial search limits of meta-analysis and English language. The yield was 32 articles. On OVID Medline, the key terms used were (music) AND (anxiety) with initial search limits of meta-analysis and English language. The yield was 47 articles. On PubMed, the key terms used were ((music) AND (anxiety) AND (hospital)) NOT (infant OR children or postpartum) with initial search limits of meta-analysis and English language. The yield was 29 articles. The cumulative total yield was 108 articles (Figure 1). The inclusion criteria were meta-analyses and systematic reviews including a music intervention that included articles where the intervention occurred in a hospital setting with adults. Meta-analysis was used as a limiter to ensure there was an abundance of evidence on the proposed topic and ensured the highest level of evidence. However, this search still yielded systematic reviews. Total articles included in meta-analysis and systematic reviews was forty-two.

Evidence Search Results

Evidence Search

The initial findings included 108 citations from the database search without any ancestral searches. There were seventy-nine duplicate articles identified and one systematic review with an earlier version. Of the 108 citations, twenty-eight were screened. A total of 17 abstracts were discarded. The reasons articles were discarded were intervention used for procedure only (10), maternity/postpartum (1), non-hospital setting (3), and a different intervention (3). There were eleven articles reviewed. Of the eleven articles, four systematic reviews with meta-analysis emerged for the project (Figure 1).

Evaluation

The level and quality of the evidence was evaluated using the JHNEBP Evidence Level and Quality Guide (Dang & Dearholt, 2017). There were five levels included in the JHNEBP Guide. The levels were from one to five with one being the highest level of evidence and five being the lowest. Level I includes experimental studies, randomized controlled trials (RCT), explanatory mixed method design that includes only a level I quantitative study, and systematic review of RCTs, with or without analysis (Dang & Dearholt, 2017). This project included five systematic reviews. Four of the systematic reviews included meta-analyses. Therefore, the five systematic reviews classify as Level 1. The systematic reviews only included quantitative studies which were evidence levels I, II, or III.

As stated above the quality was also assessed using the JHNEBP Evidence Level and Quality Guide (Dang & Dearholt, 2017). Rating A is high quality, B is good quality and C is low quality or studies with major flaws. The final five systematic evaluated for this project were all

evidence level I and quality rating A. They were all systematic reviews with meta-analysis. They all had high level of evidence, high quality rating, and high quantity of articles included.

Themes with Practice Recommendations

For review of the practice recommendations, the five systematic reviews were used. Between the five systematic reviews seventy-five articles were included with thirty-three included in the meta-analyses (Appendix A). All systematic reviews illustrated that a music intervention had some level of anxiety-reducing effect (Appendix A). The articles included in the meta-analyses overwhelming used some version of the State-Trait Anxiety Inventory (STAI) for data capture concerning anxiety. Only one meta-analysis which included five articles included studies that either included the STAI or a Visual Analog Scale (VAS) (Appendix B). In a later systematic review, STAI (multiple versions) and VAS was used. The forty-two articles were reviewed for trends (Appendix C). Four themes became apparent. These four themes were music delivery method, person selecting music, intervention strategy, and intervention schedule delivery (Figure 2).

The interventions that were most used were: the use of recorded music with headset-30/42 articles, patient selected music from a limited set-29/42, passive listening to music- 39/42, and thirty-minute session time-17/42, one session-36/42 (Figure 2). In hospitalized medical-surgical adults (P), the implementation of patient selected, recorded music from limited set using a headset of passive listening (I) compared to standard care (C) statistically significantly decreases anxiety using the State-Trait Anxiety Inventory (STAI) Scale in randomized control trials for systematic review and meta-analysis (O) within eight weeks (T).

Music Delivery Method

The first theme was the music delivery method. While reviewing all the systematic reviews, it was discovered that they all addressed the method of music delivery. The options for the method of music delivery were live music and recorded music. Given the population for the project was hospitalized adults, it is often difficult to incorporate live music into the treatment plan. Of the forty-two articles reviewed in the systematic review, two study included live music. Bro et al. (2018) reviewed an article by Ferrer (2007) using live music. All other systematic reviews used recorded music. The equipment used for recorded music changed based on the time and availability. Cassette, CD, mp3 players, headphones and loudspeakers were used by various authors for listening to recorded music. It was not discussed which equipment was most effective. For this project, limiting factors were the number of patients in the room, availability of speaker equipment, and device used. Seven studies included volume/decibel level when determining the method of delivery. The most common decibels identified were 60-80 dB though range of noted volume was 30-80 dB. Of the forty-two studies reviewed, thirty included the use of music listening via headset which is 71% of studies reviewed. The facility had an electronic patient television/ education system that had a music app available in all patient rooms at each bedside and earbuds available through the logistics or supply department. Often patient brought their own electronic devices which maybe a preferred method of music delivery.

Person Selecting Music

Across the studies, various individuals made the decision on music selection. The noted option for the person selecting the music were the investigator, patient selection from a limited set identified by the investigator, patient selected from on preference or collection, or a tailored selection based on patient assessment. One systematic review mentioned evidence for one type of person selection versus others. Bradt, Dileo, and Potvin (2013) conducted a systematic review

of twenty-six studies of which 11 studies were patient selected music intervention and 15 studies included investigator selected music. Of the twenty-six studies, sixteen reviewed music use to effect anxiety. The studies revealed that patient selected music resulted in greater anxiety-reducing effects than the usual care in myocardial patients (Bradt et al., 2013). Bro et al. (2018) also found that patient selected music was the most widely used method of selection.

Intervention Strategy

The intervention strategies observed were active participation and passive listening. Examples of active participation was described as patient singing, clapping, or tapping feet (Bro et al., 2018). Active participation usually occurred in the presence of a music therapist though only three studies included music therapist led activities. While passive listening, involved the patient only listening to music and usually occurred while the patient was alone or not interacting with others in the room. Passive listening was overwhelming the choice mostly likely observed in the systematic reviews.

Intervention Schedule Delivery

The two types of intervention delivery schedules described were the number of sessions and the length of each session. There was variance between the studies in the length of time of each session. Sessions ranged from fifteen minutes to ninety minutes. The most common length of session was thirty minutes. The number of sessions most identified was one session as opposed to multiple prescheduled sessions. The one session could be misleading as some studies would detail one session when anxiety or other symptom noted. This usually varied based on the reason for hospitalization or the need for music. If the study involved anxiety related to a specific procedure, it was one session. The evidence supported an implementation of a music intervention of passive listening for one session when anxiety noticed for 30 minutes to decrease anxiety.

Setting, Stakeholders, and Systems Change

The project setting was a regional tertiary care hospital in Florida. Four of the facilities were outpatient and one was tertiary care hospital. The hospital was authorized four hundred and fifteen beds. The pilot implementation occurred at the hospital on a 24-bed medical-surgical unit of the hospital that has a secondary focus of inpatient oncology care. Usual patient demographics are male, greater than age 40, with co-morbidities of coronary disease and cancer, as well as pre/post-surgical patients. The intervention was targeted to patient with scheduled procedures or those observed to be experiencing anxiety during their hospitalization.

The vision of this project was to create an environment that contributes to the decrease in patient anxiety. The mission of the project was to provide patients and staff with an additional tool to help decrease anxiety. The short-term objective of this project was to show positive outcomes for decreasing levels of anxiety in hospitalized patients. The long-term goal of the project was to hardwire this intervention into a standard practice for hospital staff. While assessing the facility, it was noted that employees had not been able to receive certain parts of the disruptive behavior training related to the COVID-19 pandemic. It was also discovered that the team of mental health nurses who were usually called when disruptive behavior occurs were unable to respond to these calls during the pandemic. Most disruptive behavior calls were for the acute care section which includes medical-surgical and critical care areas which accounts for the largest area in the hospital. This created a gap in appropriate care for these situations. Disruptive behavior often starts as an anxiety related to an unmet need or smaller concern then escalate to disruptive behavior. It became apparent that if the initial anxiety was identified and addressed at a lower level, it would not escalate to the need of a de-escalation team. Therefore, the intervention was aimed at addressing anxiety addresses this organizational gap.

The list of stakeholders for this project was extensive. Stakeholders include the patient first and foremost. Next was the organizational leadership who would need to approve this project. For this project, the chief nurse executive and the acute care nursing executive were verbally approached with the basic concept of the project for initial approval. Both agreed that the project could take place in the facility on a medical-surgical unit. It was shared with the nurse executive for the medical-surgical section the fiscal year 2020 data on disruptive behavior events and the top three units with de-escalation team calls. The section chief recommended the pilot unit due to the population of medical-surgical and oncology patients which most closely aligned with the literature review data. The unit had the second highest number of de-escalations calls in fiscal year 2020 and that was only one incident less than the unit with the highest number of calls. The units were similar in capacity. The project was largely focused on nursing staff as they spend considerable time with the patients and were most likely to notice changes in behavior or increase in perceived anxiety level. Next, the unit nurse manager was contacted to discuss the proposed project and gain tentative approval to conduct project on the unit.

A strengths, weakness, opportunities, and threat (SWOT) assessment was completed (Figure 3). The strengths were that staff were accustomed to completing change projects, nursing leadership approval is already obtained, organizational focus on patient centered care change. The weaknesses were that nursing staff perform several tasks daily (workload), many recent changes related to COVID, and the time required to learn the new practice. The opportunities were the number of new staff that have not receive de-escalation training, that the technology is already in the room, and that earbuds were already available. The threats to the project were competing staff priorities, lack of utilization of the music, and broken equipment that would lead to inability to implement project. The technology for the use of music was already in the patient

rooms though it was not being used for this function. The earbuds were stocked in logistics and readily available for use. This was a microsystem level change as it was a pilot and involved one unit only.

Implementation with Timeline and Budget

The first objective of the pilot was to offer training opportunities resulting in 80% of unit staff completing an in-service on the availability of music as an intervention to address anxiety by March 5, 2022. This pre-implementation objective was to ensure that a minimum of number of staff were trained prior to the initiation of the pilot. The pilot was scheduled to start week 9, March 7, 2022 (Appendix D). It took longer than anticipated to complete the approval process prior to starting. The implementation phase of the project started week 13, April 4, 2022. It lasted for 10 weeks ending June 10, 2022. The training opportunities were relevant to the pilot as understanding of the proposed change was essential to assuring a successful implementation. Though it was important for as many staff as possible to have this information prior to implementation, an eighty percent threshold was thought to be achievable when work schedules and leave requests were factored in. The education materials were shared with staff through a binder at the nursing station, an initial in-service, routine shift change huddles. There was low participation in the pre-test and sign-in sheets were not used for shift huddles. This led to difficulties determining how many staff members completed the training.

The second objective was by May 14, 2022, to demonstrate an increase in staff knowledge as illustrated by an increase of 10% in the overall average of test results from pre-test to post-test (Appendix E). The goal was to illustrate an improvement in knowledge concerning the use of music as an intervention for anxiety. It was thought to be an obtainable goal as there was training on the process, goals, and expectations of the project followed by the

implementation. At the time of the post-test, more than 80% of the staff was anticipated have some knowledge of the project as measured through completion of the pre-test. The timeline goal was delayed at the implementation phase did not end until June 10, 2022. As with the pre-test, the participation with the completion of the post-test was poor. Due to the lack of participation, an implementation evaluation was created and completed by six individuals including four RNs and two nursing assistants (Appendix F).

The third objective was by May 1, 2022, the medical-surgical unit would have provided a music intervention at least once during the patient's hospitalization to 50% of their patients during the implementation phase from March 7, 2022, to April 30, 2022 (Appendix D). The rationale for this implementation objective was that as a hospitalized patient, a procedure, surgery, or anxiety would occur at least once during the hospital stay. It was thought to be an attainable goal as most, if not all, patients should have met criteria for the music intervention, not all patients were agreeable or appropriate for music (i.e., hearing loss, level of consciousness, etc.). This goal was not attainable because there wasn't a clear way to determine the total number of patients who were appropriate was the project versus who was not appropriate for the project. The implementation was solely dependent on staff identifying patients they thought would benefit. Therefore, an accurate and agreed upon denominator for measuring this goal was not obtained. Another barrier was staff participation in completion in the checklist to document the implementation of the music intervention. The completion of the required checklist was very low. To overcome this barrier, it was discovered that data could be gathered directly from the electronic patient television/ education system that had the music app. The outcome measure was obtained in this manner.

The fourth objective was that the number of de-escalation team calls would decrease by 25% when compared to the ten weeks prior to the implementation initiation date by April 4, 2022. This was a relevant outcome goal as it would have quantified the staff's perception of self-efficacy in addressing anxiety and mild disruption without assistance. This goal should have been attainable. One potential barrier was thought to be if there were no calls for assistance from the de-escalation team. This outcome measure was appropriate, and the information was obtained.

Following the JHNEBP model, the project plan was implemented as part of the PET model. The pilot objectives and implementation occurred in the translation phase. The project plan was implemented using the 8-Step Process for Leading Change by Dr. John Kotter. This model is well recognized in change implementation. The eight steps were: create a sense of urgency, build a guiding coalition, develop a strategic vision and initiatives, enlist a volunteer army, enable action by removing barriers, generate short-term wins, sustain acceleration, and institute change (Kotter, n.d.).

Create a sense of urgency

The first step was creating a sense of urgency. Since the advent of COVID-19, evidence has illustrated a hesitancy among people to go to hospitals. Anxiety levels were increased related to hospital stays. This was an ideal platform to use to raise staff awareness and garner buy-in to the project. Also, the facility had not conducted the required de-escalation training consistently for over a year leading to a knowledge deficit concerning how to address disruptive behavior. This pilot project ensured that staff had an additional intervention to address anxiety and mildly disruptive behaviors before the behaviors started. This was part of the staff training on the need for the pilot and reiterated during initial meetings with staff.

Build a guiding coalition

The second step is to build a coalition. This pilot took a team of people both from the unit and higher levels of organizational leadership to ensure success. The main champion of the project was one day shift RN. She conducted the routine shift huddles and encouraged staff to complete the forms at the nursing station. Organization leaders often help drive the change process. They are usually able to influence and motivate staff. This would include senior organizational leadership including the chief nurse execution and the nursing executive for the acute care section. The unit nurse manager is a vitally important person to have on the team as she has the authority and most direct influence for her staff. Both the chief nurse executive and section chief nurse agreed to the completion of the project. The nurse manage was key in the completion of the evaluation forms.

Develop a strategic vision and initiatives

Initially, the plan was to meet with the guiding team to determine the vision and strategic initiatives needed to move the project forward. It was essential to create a vision of the future with the intended change in place (Kotter, 2012). The vision for this project was to have a unit in which music was routinely considered as an intervention for patients displaying anxious or disruptive behaviors. The strategies to ensure this occurs were initial training of current staff on the availability of music and how to access it and the benefits both to the patient and the unit. It also required a plan to ensure that future staff were aware of the process and why it was needed. A meeting with the nurse manager and charge nurse champion occurred to ensure that all parties understood the objectives of the pilot and the roles of the participants in the project. All agreed with the pilot and how to implement the process.

Enlist a volunteer army

An important part of this process was to communicate the vision successfully to many staff (Kotter, 2012). This was achieved by identifying a project champion who assisted on the pilot unit and was a resource for staff with questions. The project champion was identified by the nurse manager as someone who would assist. The goal was to have at least one project champions for each shift. This was not met as there was only one project champion for the project. However, the champion worked twelve-hour shifts and had contact with staff from both shifts. Since they do work on the pilot unit and having established relationships with other staff, they were in an ideal position to promote and champion the project. The champion was also able to monitor some of the information gathering and help to keep the momentum going. Unfortunately, the momentum and enthusiasm for the project was low on the unit.

Enable action by removing barriers

If the project was initiated as stated, it was thought that there shouldn't be any barriers to participation. By having the unit manager as part of the guiding team, this ensured that leadership is not a barrier to the project. The initial training was to ensure that staff knew the expectations. Frequent contact with the unit champions and manager occurred at least weekly to identify barriers to the pilot. Some potential barriers were identified in the pre-implementation phase and included lack of utilization of the system and the system malfunctioning (Figure 3). Coordination between management and other services were initiated to ensure that any malfunctioning equipment is addressed and fixed or replaced in a timely manner. The greatest barrier was a perceived lack of staff engagement as determined by the lack of participation in the pre-/post-test and implementation checklist. This was challenging as an appropriate intervention was not identified throughout the project. Increased frequency of rounding occurred by this

author and one on one engagement and reminding of staff to complete the required documentation. However, completion of the documentation remained low.

Generate short term wins

The goal was for the project to have project markers to present opportunities for short wins as the project progressed. Team updates or huddles did occur once the project was initiated and most shift huddles for the duration of the project. This was confirmed anecdotally through conversations with staff during unit rounding. Updates on the lack of documentation and the need for completion of the checklist and pre-/post-test occurred during rounding. This was done to encourage improved participation as a short-term win and for check-in to ensure that the project remained on track.

Sustain the acceleration

The weekly rounding served to sustain the acceleration of project. The project champions were an important part of sustaining the change as they were in the environment reminding staff about the project and following-up on whether the objectives were being met. The buy-in and enthusiasm for the project was never fully garnered; therefore, there were challenges in sustaining the momentum and acceleration of the project. Though this was the interpretation throughout the project, the outcome measure of use of the electronic music app illustrated that the interventions for sustained momentum were effective as the use of music increase during the implementation phase more than anticipated.

Implement change

Once the ten weeks were completed a sustainment plan was to be implemented to ensure sustainment. The sustainment plan was to include adding this project to the unit data board for monitoring and measurement for success over a three-month period. This was recommended as

part of the unit leadership presentation/discussion of project outcomes and occurred outside of the pilot project framework but is a tool for the unit to accept ownership of the process and ensure that the new process is embedded in the unit culture.

Budget

This pilot project had a low organizational cost as the technology and supplies were readily available in the facility. Therefore, most cost were in kind cost. The cost was associated with equipment and supplies that were needed. The other items used were basic supplies such as pencils and paper, etc. Those items were provided by the authors for creation of presentation tools for the unit trainings (Figure 4). The anticipated need for staff overtime or work outside of normal duty hours did not occur.

Results

Participants were identified using convenience selection of staff and self-selection (volunteer or request) of participants. The inclusion criteria for the intervention were any patient who is perceived to be experiencing anxiety or mild disruptive behavior, patients who were pending a procedure that causes the patient to feel anxious (self-reported). The exclusion criteria included anyone who declined the intervention, patients who were severely hearing impaired, inappropriate level of consciousness, or patients identified as inappropriate by staff for other reasons.

Three of the four objectives were measured as percentages and the pre-/post-test were measured using a unpair t-test. The first objective of the pilot project was to offer training opportunities resulting in 80% of unit staff completing an in-service on the availability of music as an intervention to address anxiety by March 5, 2022. The clinical staff were trained on the project and the expectations for successful implementation through in-services and shift huddles.

A binder was kept at the nursing station with a paper copy of the training, the pre- and post-test, and implementation checklist. A pre-implementation test (Appendix E) was conducted to identify gaps in knowledge on the project topic and the use of music equipment. Face validity was successfully verified by the completion of the test by six registered nurses. Two of the tests were completed correctly, two with two answers incorrect, and two with one question answered only partially correct. There were two questions that were answered incorrectly most frequently: the verbal consent question (#4) and the multiple answer question (#1). This is an accurate reflection of the questions that were anticipated to require additional training. The goal of the test was to complete targeted education based on the information obtained from this test on knowledge deficiencies to the implementation of music to the patients. One champion from the unit was identified to assist with the training of all staff. The trainings and reminders of the process occurred during shift change huddles in a face-to-face method. Unfortunately, very few staff members on the participating unit took the pre-test and a sign-in sheet was not completed for shift change huddles. There was a total of five individuals who completed the pre-test. The unit staffing levels were influx but remained at approximately forty employees. The percentage of staff who completed the pre-test was approximately 12.5%. After implementation of the project, the same test (Appendix E) was administered to ensure that knowledge gaps were successfully met. Four individuals completed the post-test or approximately 10% of the staff.

The second objective was by May 14, 2022, to demonstrate an increase in staff knowledge as illustrated by an increase of 10% in the overall average of test results from pre-test to post-test (Appendix E). The overall average of test results from pre-test to post-test increased by 2%. The pre-test cumulative average score for the five tests taken was 68%. The post-test cumulative average score for the four tests taken was 70%. Due to poor participation in the data

collection and pre- and post-test completion the timeframes were extended. Staff were able to complete the pre-test throughout the implementation phase and the post-test date was collected during the last week of implementation and the following two weeks. Also, due to the lack of participation in the documentation a program evaluation form was created. Six staff members completed this form, four RNs and two nursing assistants. The responses were varied without apparent themes in qualitative data. The one consensus was that the music was used to assist with disruptive behaviors more than other reasons.

The third objective was that the medical-surgical unit would have provided a music intervention at least once during the patient's hospitalization to 50% of their patients during the implementation phase. This objective was not met. A checklist tool (Appendix G) was used by clinical staff to track how frequently the music intervention was used on the pilot unit. The checklist was kept at the nursing station in a binder and clinical staff were to complete the form when music was used. The data collected was nominal/scale and include behavior exhibited, duration of intervention, outcome. The data was to be collected per episode of use as opposed to by person. If the checklist was not completed correctly or contained missing data, the entry was not included in project data. The checklist did not include any patient identifiers ensuring patient privacy was maintained. The unit champion and this author were able to complete observations randomly throughout the project timeframe to ensure correct use of the form. There was poor participation in the data collection of music used. Though frequent rounding and huddles were complete, there were only four documented uses of the music implementation. The statistical analysis was to be completed using an unpaired t-test. Unfortunately, due to limited data and that the same results were report in all four cases for all datapoints except one, the unpaired t-test could not be completed. In all four cases, the patient gender was male, the music was used for

patients with disruptive behavior only, and all patients' behavior improved. The only variation was the length of time that the music was implemented. The music was used between 3-5 hours in duration with an average duration of 4 hours. This was eight times the recommended length of 30 minutes of music use. A two-tailed Wilcoxon signed rank test was conducted to examine whether there was a significant difference between the pre-test and post-test scoring. The results of the two-tailed Wilcoxon signed rank test were not significant based on an alpha value of .05, $V = 3.00$, $z = 0.00$, $p = 1.000$. Due to the poor participation in data collection on the unit, data on the number of times music was used on the electronic patient television/ education system that has a music app available was obtained. During the ten weeks preceding the implementation music was not used. During the implementation period, music was used in the system 68 times. This illustrates that though staff did not use the data collection forms, they still used the music intervention during the implementation period.

The fourth objective is that the number of de-escalation team calls will decrease by 25% when compared to the eight weeks prior to the implementation. Benchmark data was reviewed of disruptive behavior reports. The expected outcome based on literature review would be a decrease in anxiety which would lead to a decrease in the use of the de-escalation team. During the ten weeks preceding the implementation the de-escalation team was called five times compare to once during the implementation phase. This accounted for an 80% decrease in de-escalation team usage. The project was approved by USAHS and the facility IRB prior to initiation on the unit.

Impact

The project has increased staff awareness of the use of music as a distraction technique. Staff didn't complete the data capture tool as robustly as necessary to demonstrate significant

results of the implementation. However, anecdotally, it was observed that staff used music for distraction purposes. During rounding on the unit, staff often mentioned that they had music on in various patients' rooms. The project provided a reminder for staff as to where music was in the room and how to obtain earbuds for use as indicated. It also emphasized the various types of diagnoses and situations music was appropriate for use.

Music as a distraction technique to decrease episodes of disruptive behavior is a topic that has the potential to be applied to many practice areas. This project was conduct in an acute medical-surgical inpatient environment. The next step would be to expand the use of music for this specific purpose to other practice areas. Other areas to consider in this organization would be critical care, surgical, hospice, and mental health locations. Expansion to the other medical-surgical areas would be a straightforward first step as it would demonstrate a growth from one unit to multiple similarly situated units. Next would be to expand beyond the inpatient medical-surgical patient. There was robust evidence in the literature to support the music intervention in a critical care environment so that would be the area recommended for the next area of expansion. From there, additional expansion should be the specialty areas of inpatient care followed by outpatient services.

Data capture was a limitation of this project. Handwritten data capture by project developed tools was used. This was an additional step for staff to complete and it was outside of the usual documentation structure used by the organization. It led to a situation of decreased data capture as staff did not consistently document on the provided tools though it was anecdotally noted during rounding that staff did use music. It is recommended that developing a way to track the use of music within the current medical record documentation structure would improve the accuracy of data capture. This is an important first step to accurately assessing the impact of the

music intervention and evaluating its effectiveness. It was also determined that the music app system could assist in data gather as it allowed for tracking of how often music was used through the electronic system. This would not help with the tracking of the use of music through personally owned equipment but is an important step accurate determination of use of the current available facility technology. It also didn't require additional documentation from staff. To ensure sustainability of the intervention, it is recommended that annual in-services on the topic be conducted. Staff were aware of music and its distraction effectives, but reminders of when it is appropriate to use this intervention would improve its use for the purpose of decreasing anxiety and the use of the behavioral de-escalation team.

Dissemination

The information garnered from the project was shared with facility senior leadership, area leadership, and unit staff. The preferred method of reporting out at the clinical site is by presentation using Power Point via TEAMS. A Power Point presentation was completed for informational dissemination at the facility. It included nursing leadership and unit manager. A poster and paper were completed for best opportunity for dissemination. The finished manuscript was available via the scholastic open access repository (SOAR@USA) through the University of St. Augustine for Health Sciences. Prior to all submissions, the article was peer reviewed using a non-blinded process with a doctoral prepared nurse with a research background or subject matter expertise.

Conclusion

The music intervention implementation pilot project was designed to present hospital staff with an additional intervention to address anxiety. The project incorporated the JHNEP framework and Kotter's 8-step change model. Due to COVID restriction, training in these skills

was limited and led to many staff either not receiving or delinquent in training. Through the implementation of this project, anxiety and disruptive behavior was decreased as evidence by a decrease in the use of the hospital disruptive behavior de-escalation team by 80% and an increase in use of the music app when comparing the 10 weeks preceding the implementation phase to the implementation phase. Hospitalization can contribute to increased levels of anxiety that can lead to disruptive behavior and the need for advanced de-escalation skills.

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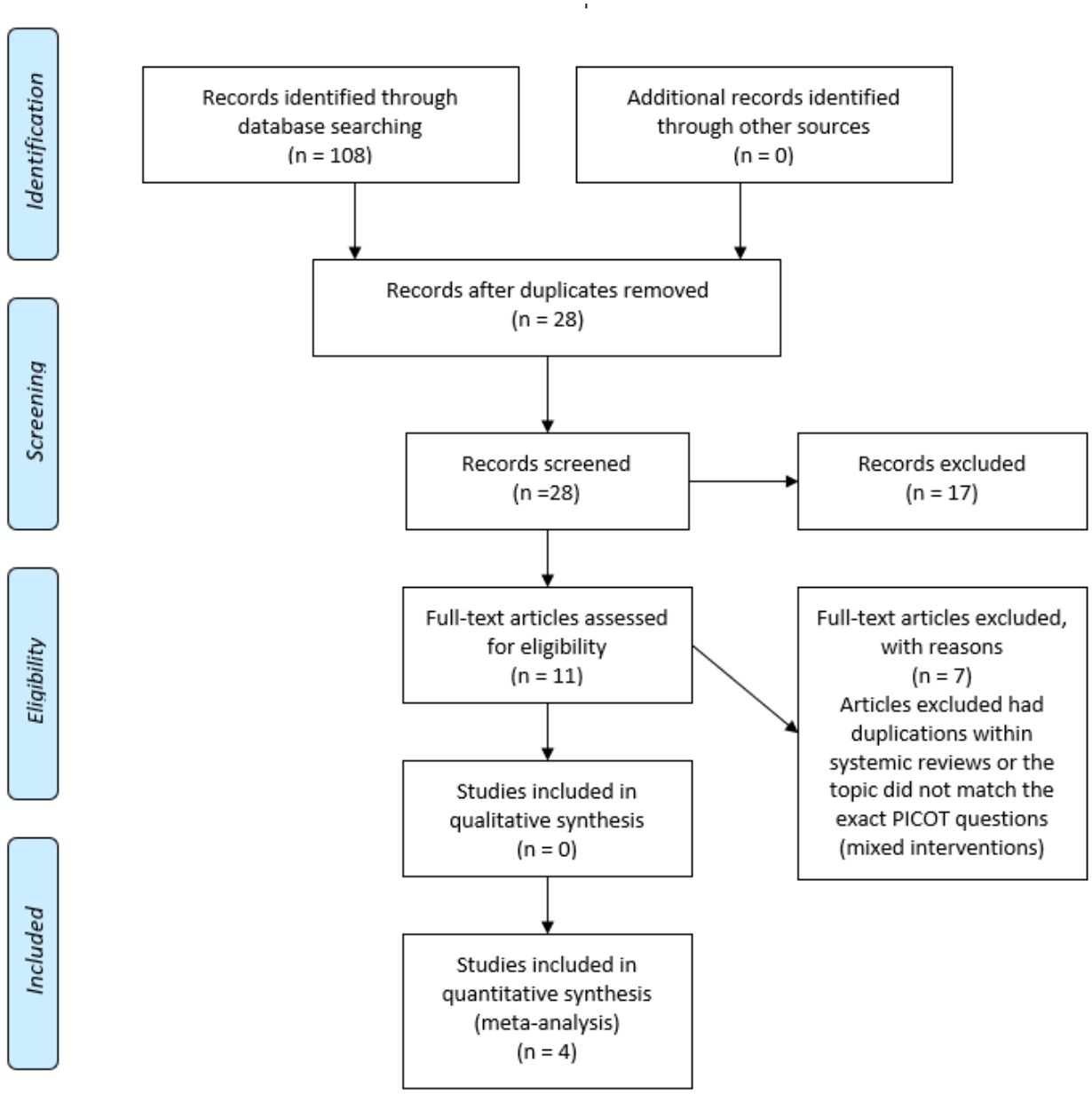
Figure 1

PRISMA flow chart diagram.



Note. Prisma flow chart diagram from "Preferred Reporting Items for Systematic Reviews and Meta-analyses: The PRISMA Statement," by D. Moher, A. Liberati, J. Tetzlaff, & D.G. Altman, 2009, Annals of Internal Medicine, 151(4), p.267 (http://dx.doi.org/10.7326/0003-4819-151-4-200908180-00135). Copyright 2009 by The American College of Physicians.

Figure 2

Synthesis of themes.

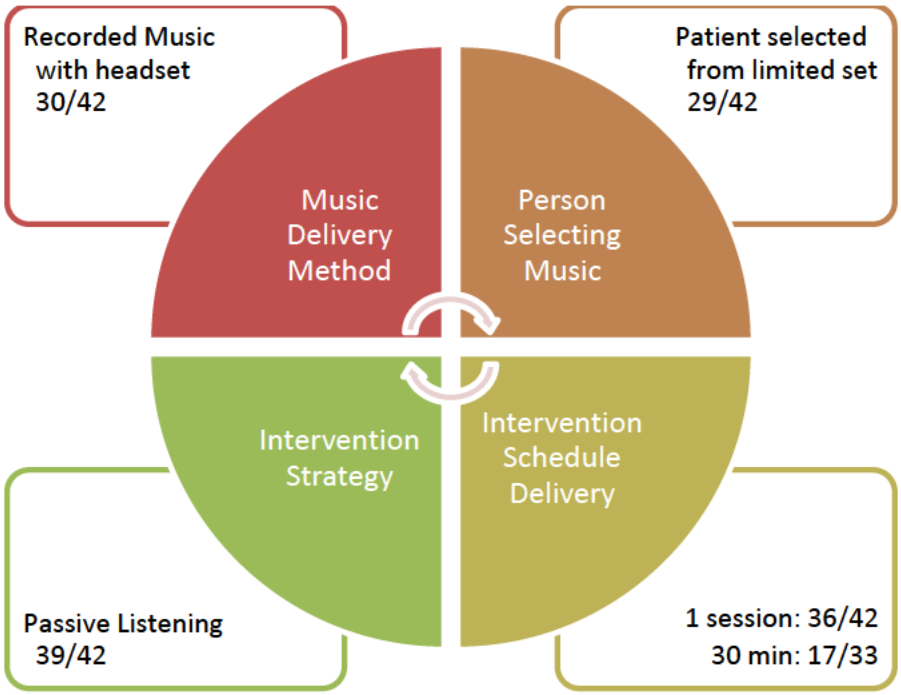


Figure 3

SWOT analysis diagram.

Figure 4

Project budget.

Direct Costs Only							
Personnel (Title of Position)	**Number Needed**	**Total Hours**	**Salary**	**Fringe Benefits (28%)**	**Total Salary**	**Total Cost in Dollars**	**Funding Source**
RN Champion	2	20	$56,240	$19,760	$76,000	$1461.54	In Kind
Staff RNs	13	2	$56,240	$19,760	$76,000	$950.00	In Kind
Staff CNAs	2	2	$22,320	$8680	$31,000	$29.81	In Kind
Subtotal Cost						**$2441.35**	

Equipment	**Number Needed**	**Cost per Unit**	**Total Cost in Dollars**	**Funding Source**
Computers	1	$450.00	$450.00	In Kind
Printers	1	$899.00	$899.00	In Kind
Earbuds	20	$1.99	$39.80	In Kind
Subtotal Cost			**$1,388.80**	

Supplies	**Number Needed**	**Cost per Unit**	**Total Cost in Dollars**	**Funding Source**
Paper	3 reams	$5.79	$17.37	In Kind
Pens	12	$0.15	$1.79	In Kind
Lamination	30 sheets	$3.00	$90.00	Self
Binder	1	$5.00	$5.00	Self
Stapler	1	$3.99	$3.99	In Kind
Staples	1 box	$2.49	$2.49	In Kind
Pencils	2	$2.42	$4.84	In Kind
Scissors	1	$5.29	$5.29	In Kind
Stencils	2 packs	$9.99	$19.98	Self
Tape	1	$3.99	$3.99	In Kind
Glue Stick	1	$1.06	$1.06	Self
Subtotal Cost			**$155.80**	
Total of Subtotal Cost			**$3,985.95**	
Indirect Cost (25%)			**$996.49**	
TOTAL COST			**$4,982.44**	
REVENUE				
Billing			N/A	
Grants			N/A	
Institutional budget support			**$4,866.40**	
TOTAL REVENUE			**$4,866.40**	
NET BALANCE			**$116.04**	

Appendix A

Summary of Meta Analysis (MA)/Systematic Reviews (SR)

Citation	Level of Evidence/Quality Grade	Question	Search Strategy	Inclusion/ Exclusion Criteria	Data Extraction and Analysis	Key Findings	Usefulness/ Recommendation/ Implications
Bradt et al., 2013	1/A	What is the effect of music for anxiety and stress in coronary heart disease patients?	Cochrane Central Register of Controlled Trials (CENTRAL) on The Cochrane Library (2012, Issue 10), MEDLINE (OvidSP,1950 to October week 4 2012), EMBASE (OvidSP, 1974 to October week 5 2012), CINAHL (EBSCOhost, 1982 to 9 November 2012), PsycINFO (OvidSP, 1806 to October week 5 2012), LILACS (Virtual Health Library, 1982 to 15 November 2012), Social Science Citation Index (ISI, 1974 to 9 November 2012), a number of other databases, and	Randomized controlled trials and quasi-randomized trials that compared music interventions and standard care with standard care alone for persons with confirmed congestive heart disease.	Two review authors independently extracted data and assessed methodological quality. Results presented using weighted mean differences for outcomes measured by the same scale, and standardized mean differences for outcomes measured by different scales. Post-intervention scores were used. In cases of significant baseline difference, change scores	26 trials (1369 participants) reviewed. Listening to music was the main intervention used. 23 of the studies did not include a trained music therapist. 16 RCT focused on anxiety with total of 596 participants. Listening to music has a moderate effect on anxiety in people with CHD; inconsistent results across studies (SMD = -0.70, 95% CI -1.17 to -0.22, P = 0.004, I2 = 77%). Studies that used music interventions in people with myocardial infarction found more consistent anxiety-reducing effects of music, with an average anxiety reduction of 5.87 units on	Listening to music may have a beneficial effect on anxiety in persons with CHD, especially those with a MI. Anxiety-reducing effects greatest when people were given a choice of which music to listen to. Listening to music may have a beneficial effect on SBP HR, RR, sleep quality, and pain in persons with CHD. Clinical significance of these findings is unclear.

			clinical trial registers, conducted handsearching of journals and reference lists. No language restrictions applied.		(changes from baseline) were used.	a 20-to-80-point score range (95% CI -7.99 to -3.75, P < 0.00001, I2 = 53%). Studies that used patient selected music resulted in greater anxiety-reducing effects that were consistent across studies (SMD = -0.89, 95% CI -1.42 to -0.36, P = 0.001, I2 = 48%).	
Bro et al., 2018	1/A	What is the effect of music for anxiety and stress in cancer patients?	A total of 2624 records through 2 systematic searches (June 2015 and September 2016) in PubMed, Scopus, EMBASE, CINAHL, Web of Science, Cochrane, and PsycINFO and used Risk of Bias Assessment, GRADE and Checklist for Reporting Music-Based Interventions to evaluate the music applied and quality of the studies. We conducted meta-analyses using	Randomized, controlled trials with adult patients in active cancer treatment exposed to different music interventions versus control conditions. Included articles in English and German. Qualitative studies and systematic reviews were excluded.	Two review authors independently screened all titles and abstracts evaluating full text articles for inclusion. Disagreements discussed and clarified in consensus with a third author. Reference lists of reviews were hand-searched for additional references. The research dates were June 26,	25 RCT's (N = 1784) of which 20 were eligible for the meta-analysis (N = 1565), 9 concerning anxiety. Listening to music (15/25). Music therapy by music therapist (Active participation 10/25). 12 RCTs focused on anxiety. 11 through recorded music. Music reduced anxiety (SMD −0·80 [95% CI, −1.35 to −0.25]), pain (SMD −0.88 [95% CI −1.45 to −0.32]), and improved mood (SMD −0.55 [95% CI, −0.98 to −0.13]).	The most effective mode of music intervention appeared to be passive listening to self-selected, recorded music in a single session design. Listening to music better than standard care alone. 1 article overlaps with Bradt 2013 pre-op (Linn, 2011-in meta-analysis)

			Review Manager (version 5.3). PROSPERO reg. no. CRD42015026024.		2015, and September 1, 2016, for update search.		
Umbrello et al., 2019	1/A	What is the effect of music for anxiety and stress in critically ill patients?	PubMed, CINAHL, Cochrane Library, Scopus, Web of Science, ILISI (Indice Italiano di Letteratura di Scienze Infermieristiche), from inception to t April 30th, 2018. English or Italian. Manually screened the reference list of every paper to identify additional potentially eligible studies.	Excluded studies with patients younger than 18 years old known psychiatric disorders and studies investigating interventions other than music therapy or whose outcome was the analysis of biochemical pathways.	Two authors independently extracted data from included studies. A c data sheet was created to record the author, year, design of the study, inclusion and exclusion criteria, population, intervention, outcomes, potential sources of bias, adverse effects of the intervention.	Systematic Review of 10 RCA and 1 quasi-experimental design with 959 participants. Statistically significant difference in post-test state anxiety between groups: mean value 10.16 (M) vs. 16.15 (C), P<0.001. Subjects in both conditions had reduced state anxiety scores over time; music therapy was more effective than a rest period in reducing state anxiety (C 49.67±4.82 vs. M 38.67±5.23, P<0.01). Subjects in the music group had reduced state anxiety scores over time: 15.4±4.6 vs. 13.8±2.8, P=0.048; state anxiety in the control group was like baseline value	Music therapy is consistently associated with a reduction in anxiety and stress of critically ill patients. Listening to music better than standard care alone. Only 2 articles from United States.

Legend: BP: blood pressure, C: Cochran's C test (one-sided upper limit variance outlier test), CAIRSS: Computer-Assisted Information Retrieval Service System, CENTRAL: Cochrane Central Register of Controlled Trials, CHD: Coronary Heart Disease, CI: Confidence Interval, CINAHL: Cumulative Index to Nursing and Allied Health Literature, EMBASE: Excerpta Medica Database, HR: heart rate, I^2:variation due to heterogeneity, ILISI: Indice della Letteratura Italiana di Scienze Infermieristiche, LILACS: Literatura Latino-Americana e do Caribe em Ciências da Saúde, M: Mean/Median, MA: Meta Analysis, MD: Mean Deviation, MEDLINE: MEDLARS on-line, N: Number of cases, P: Significance level, PROSPERO: International database of prospectively registered systematic reviews with a health related outcome, PsychINFO: Psychological Information Database, RCT: Random Control Trial(s), RR: Respiratory Rate, SMD: Standard Mean Difference, SpO2: Peripheral Oxygen Saturation, SR Systematic Review, STAI: Spielberger State-Trait Anxiety Inventory Scale, STAI-S: Spielberger State-Trait Anxiety Inventory Scale-Short

Appendix B

Included Systematic Review Evaluation

Systematic Review	**Type of Patient**	**Type of Intervention**	**Anxiety Related Outcome Measures**	**Number Studies**	**Average for Music vs. Standard Care**	**Number of Sessions/Length of Time-as related to outcome**
Bradt et al., 2013 20 articles US	MI, Surgical or procedural, rehabilitation	23 articles used "listening to music" as the intervention	All Measures (NRS, VAS, HADS, STAI)	20	0.7 SD lower	15-90 min, single and multiple sessions
		3 articles used music therapy	MI patients-State Anxiety (STAI-S)	6 (Meta-analysis)	5.87 lower	
		1 article included a musical therapist				
Bro et al. (2018)	Patients receiving cancer treatments	Passive listening (Recorded music)	State Anxiety (STAI)	12/9 (Meta-analysis)	0.65 lower	20=30 min, single and multiple sessions
		Active Participating	Non-STAI	3	--	
Umbrello et al., 2019	Critically Ill Patients	Passive listening (Recorded music)	C-STAI, STAI, STAI-S, VAS-A	11	--	15-60 min intervals, single and multiple sessions, 30min single interval most common

Appendix C

Review of 42 Articles included in Systematic Reviews for Trends

Author	Intervention Content				Intervention Schedule Delivery	
	Music Repertoire Form, tempo, rhythm, melody, harmony, voicing, tonality, lyrics	**Music Delivery method** 1. Live music Musician Instrument 2. Recorded music Equipment: headphones vs loudspeakers Volume/decibel level	**Person selecting the music.** (1) Preselected by investigator (2) Patient selected from limited set (3) Patient selected from own preference or collection (CD) (4) Tailored based on patient assessment	**Intervention strategy** 1. Passive listening 2. Active participating Involvement	1. Single/multiple session 2. Duration 3. Frequency Single session Multiple session	
Binns Turner (2011)	1-4 types of music: classical, easy listening, inspirational, new age	Recorded music (IPod) Equipment: earphones (also controls) Volume: Max 70 dB	2	Passive	60 min	
Clark (2006)	No info	Recorded music (cassette tape) Equipment: headphones Volume: no info	4	Active Relaxation techniques, imagery, positive self-talk		90 min tape. Length of sessions unknown Frequency: 2-4 times per week for 4-5 weeks
Ferrer (2007)	Patient preferred favorite songs and music styles.	Live music Musician: music therapist? Singing with classical guitar accompaniment	3	Active Singing along, clapping, tapping their feet	20 min	
Lawson (2011)	No info. Patients chose from a pre-existing radio playlist including a variety of music genres and eras.	Recorded music Equipment: Apple iPad mini Volume: no info	2	Passive	60 min	
Li (2011)	202 music pieces available:	Recorded music (MP3)	2	Passive		30 min twice a day

	Chinese classical folk music, famous world music, Chinese relaxation music.	Equipment: headphones Volume: controlled by patients				Frequency: from 1st day after surgery until 3rd chemotherapy
Lin (2011)	1. Three-step GIM process: Preparation Period (10 min): Songs of the Pacific Deep Relaxation Period (12 min): meditation-relaxation tape with verbal instructions. Light music, forest piano with sounds of nature Music listening Period (38 min): Violin rain, aroma lavender. 2. Data from relaxation group was not included in this review.	Recorded music (CD) Equipment: headphones Volume: 55-70 dB	1	Active Guided relaxation	60 min	
O'Callaghan (2012)	No info. Patient brought music to their first treatment.	Recorded music Equipment: loudspeaker Volume: at reasonable level	3	Passive	Not reported	
Vachiramon (2013)	No info. Patients chose a musical genre, artist, or track, which was entered into internet radio.	Recorded music Equipment: loudspeaker Volume: no info	2	Passive	15-60 min	
Zengin (2013)	Turkish classical, slow, instrumental, relaxing music	Recorded music Equipment: music system Volume: no info	1	Passive	30 min	
Allen (2001) Outpatient	Participants selected from 22 types of music including soul hits, classical guitar, chamber music, folk music, or popular singers from the 1940s and 1950s	Recorded music Equipment: Headphones Volume: no info	2	Passive	Not reported	
Augustin (1996) Inpatient	Participants selected from classical, environmental, new age, western country, or general easy-listening music	Recorded music	2	Passive	15-30 min	

Cassidy (2003) Outpatient	Participants were asked to bring the music of their choice from home	Recorded music	3	Passive	15 min	
Cooke (2005) Outpatient	Patient-selected pre-recorded CD from one of the following genres, classical, jazz, country and western, new age, or easy listening	Recorded music Equipment: headphones	2	Passive	30 min	
DeMarco (2012) Outpatient	CD selected by a music therapist: "Music for Unwinding". Music was composed by J Nagler, music therapist. The music style was identified as New Age	Recorded music Equipment: headphones	1	Passive	20 min	
Guo (2005) Not reported China	Participants selected from six types of pre-recorded music (classical music, light music, pop music, folk music, folk songs, and opera).	Recorded music Equipment: headphones	2	Passive	30 min	
Lee (2004) Inpatient China	Participants selected from eastern and western style easy listening music or Chinese pop music	Recorded music	2	Passive	20-40 min	
Miluk-Kolasa (2002) Inpatient Poland	Not reported	Recorded music	Not reported	Passive	60 min	
Ni (2011) Outpatient Taiwan	Investigator-selected mini library of soothing popular Chinese and Taiwanese pop songs (low-tone, slow rhythm ballads only). Participants selected music from this library	Recorded music Equipment: Headphones	1	Passive	20 min	
Szeto (1999) Inpatient Hong Kong	Participants selected from slow rhythmical songs: Chinese or Western music. This music was determined to have sedative qualities by a panel of experts	Recorded music	2	Passive	20 min	

Winter (1994) Outpatient USA	Participants were asked to select from Schumann: Quartet for Piano and Strings in EFlat Major, Tchaikovsky: Symphony No. 6 in B minor ("Pathetique"), Beethoven: Symphony No. 2 in D Major (op. 36), Johnny Cash's Greatest Hits, Willie Nelson's Greatest Hits, The Beatles Part I, The Beatles Part II, Benny Goodman: Small Group 1941-1945, Johnny Mathis: Better Together, Madonna: True Blue. The Temptations: 26th Anniversary, or The Mamas & The Papas: If You Can Believe Your Eyes	Recorded music Equipment: Headphones	2	Passive	50 min	
Yung (2002) Inpatient Hong Kong	Participants selected from slow rhythm songs, Chinese slow rhythm songs or Western slow rhythm songs	Recorded music Equipment: Headphones	2	Passive	20 min	
Yung (2003) Inpatient Hong Kong	Participants were given choice of 3 tapes approved by panel of 3 music instructors at the university level. The panel agreed that the music was sedative in that it possessed minimal rhythmic characteristics. Choices included: Chinese instrumental music, Western instrumental music, or Western and Chinese slow songs	Recorded music Equipment: Headphones	2	Passive	20 min	
Chlan (1997) Critical care	Classical, new age, country/western, religious, and easy listening.	Recorded music Equipment: Headphones	2	Passive	30 min	

Han (2010) Critical Care China	Participants were asked to select from investigator's selection. There were over 40 choices from four categories of relaxing music, including Western classical music (e.g., Moonlight Sonata, Appassionata), Western light music (e.g., Brahms Lullaby, Ballade pour Adeline), Chinese traditional music and Chinese folk songs with lyrics All the musical options were of a relaxing nature containing slow, flowing rhythms that duplicate pulses of 60 to 80 beats per minute (Chlan 1998, 2000) and were familiar to Chinese people.	Recorded music Equipment: Headphones	2	Passive	30 min	
Lee (2005) Critical Care China	Chinese classical music, religious music (Buddhist and Christian), Western classical music and music with "natural sounds"	Recorded music Equipment: Headphones	2	Passive	30 min	
Wong (2001) Critical Care China	Chinese music (Chinese folk song, music played by Chinese instruments, Chinese music played by Western instruments, Buddhist music) and various Western music (classical, soundtrack, piano)	Recorded music Equipment: Headphones	2	Passive	30 min	1 music condition 1 rest condition 30 min
Wu (2008) Critical Care Taiwan	Participants were asked to select from Chinese, religious, New Age, hymn, classical or orchestral music with slow tempo. Most participants selected old Taiwanese popular songs without lyrics (n = 17) and religious music (n = 7, 24)	Recorded music Equipment: Headphones	2	Passive	30 min	

Bolwerk (1990) Inpatient	compilation tape of (a) Largo by Bach, (b) Largo by Beethoven, (c) Prelude to the afternoon of a Faun by Debussy	Recorded music	1	Passive		3 sessions on 3 consecutive days 22 min
Cohen (1999) Inpatient	(a) New Age, (b) music from decades past, (c) contemporary solo instrumentalists, (d) religious, (e) classical	Recorded music	2	Passive	30 min	
Winters (2005) Inpatient	Relaxing music	Recorded music	2	Passive		3 sessions 20 min
White (1999) Inpatient	Classical music	Recorded music Equipment: Headphones	1	Passive	20 min	
White (1992)	4 classical adagios, tempo of approx. 60 bpm	Recorded music Equipment: Headphones	1	Passive	25 min	
Elliot (1994) Inpatient Australia	light classical music relaxation tape designed by Bonny.	Recorded music Equipment: Headphones	1	Passive		2 or 3 sessions 30 min
Chlan (1998)	4 non-lyric playlists: new age, country, religious, classical, 60-80 bpm	Recorded music Equipment: Headphone	1	Passive	30 min	
Chan (2008)	relaxing music defined primarily as being low-pitched, having a simple and direct musical rhythm and having a tempo of approximately 60-80 bpm.	Recorded music Equipment: Headphone	1	Passive	30 min	
Cooke (2010)	classical, jazz, country, and western, new age, easy-listening or 'other' (mostly by contemporary artists)	Recorded music Equipment: Headphone	1	Passive	60 min	
Dijkstra (2010)	Classical and easy-listening music	Recorded music Equipment: Headphone	1	Passive		3 sessions over 2 days 30 min

Han (2010)	4 categories of relaxing music, including Western classical music, Western light music, Chinese traditional music, and Chinese folk.	Recorded music Equipment: Headphone	1	Passive	30 min	
Korhan (2011)	Classical music	Recorded music Equipment: Headphone	1	Passive	60 min	
Su (2012)	Four pieces of sedating piano music composed by two of the authors. volume: 30-40 dB, 60-80 bpm	Recorded music Equipment: Headphone	1	Passive	45 min	
Chlan (2013)	relaxing music played on piano, harp, guitar, and Native American flute	Recorded music Equipment: Headphone	1	Passive		Music Therapist assessment w/in 24 hr. Music offered twice per day. Length of session not reported.
Lee (2017)	slow beat (60-80 bpm), relaxing music: Western classical music, Chinese classical music, music of natural sounds, or religious music	Recorded music Equipment: Headphone	1	Passive	30 min	

Appendix D

Project Schedule

Activity	W1	W3	W5	W7	W9	W11	W13	W15	W1	W3	W5	W7	W9	W11	W13	W15	W1	W3	W5	W7	W9	W11	W13	W15
Meet with preceptor																								
Prepare project proposal																								
Meet with Chief Nurse for Acute Care (ensure project can occur in this area)																								
Meet with Chief Nurse for Education to discuss need for IRB approvals.																								
Receive university approval for project																								
Create IRB proposal, submit and receive approval																								
Meet with unit Nurse Manager to review project objectives and identify project champions																								
Implement project: 1. Give pre-test 2. Provide education 3. Provide Checklist Tool to Champions 4. Nursing Staff to implement intervention as needed for 8 weeks 5. Facilitator to participate in team huddles weekly 6. Give post-test																								
Data review																								
Manuscript development																								
Dissemination																								

Appendix E

Clinical Staff Pre-, Post-Implementation Test

1. Where can music be found in a standard patient room? Choose all that apply.	A. Bathroom B. Bed Controls C. Get Well Network D. Patient's personal device
2. Music can contribute to a decrease in anxiety.	A. True B. False
3. An example of a type of patient that can benefit from music is:	A. Pre-operative patient B. Pre-procedural patient C. Dementia patient D. Cardiac patient E. Cancer patient F. All the above
4. Patient permission or verbal consent is required prior to initiating music.	A. True B. False
5. Evidence has shown that what dosage of music is most effective?	A. 15 minutes B. 30 minutes C. 45 minutes D. 1 hour

Appendix F

Clinical Staff Evaluation of the Pilot Program

Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Unit staff are using the intervention.					
Unit staff have not missed any opportunities to use the music intervention.					
The patients are satisfied with the music intervention.					
The music intervention is effective as a distraction technique for this patient population.					
The process for using this music intervention is user-friendly and easy to follow.					
There are identified barriers or challenges to application of the music intervention.					
There are identified barriers or challenges to documentation of the music intervention.					
The music intervention will continue to be used after the conclusion of the pilot.					

1. What population was the music intervention most effective at reducing anxiety and disruptive behavior, ranked 1-5?

    a. Surgery
    b. Dressing Change

c. Catheter Insertion
d. Behavior
e. Other

2. What worked well with this pilot?

3. What were the challenges/barriers encountered or that did not work well with this pilot?

4. Is there any that could have been done better or differently to improve the use of the music intervention?

5. Overall, how satisfied were you with the music intervention.

Appendix G

Checklist for Implementation of Music

ID	**Date**	**Age**	**Gender** 0=Female 1=Male	**Reason for Music** 0=Surgery 1=Dressing change 2=Catheter insertion 3=Behavior 4=Other (name)	**Duration** In minutes	**Outcome** 0=No change 1=Improved 2=Worsened
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						