

MUSIC AS A THERAPEUTIC NURSING INTERVENTION AND CARDIAC SURGICAL
INPATIENTS' EXPERIENCE: A QUALITY IMPROVEMENT PROJECT

by

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DEDICATION

This project is dedicated to all the patients and nurses on the participating cardiovascular telemetry unit. Your enthusiasm and commitment to quality and patient-centered care is strong. I also dedicate this project to my parents who have supported all my life-long scholarly endeavors.

Thank you for all of your love and encouragement.

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ABSTRACT

Enduring cardiac surgery can result in physical pain and feelings of anxiety during the recovery period. Although pharmaceutical interventions exist to help alleviate these symptoms, complimentary therapies are seldom encountered in hospital settings. Listening to calming music has been shown to improve the patient experience and can be a safe adjunct to standard pharmaceutical management of pain and anxiety. The aim of this project was to implement music as a nursing intervention for open-heart patients and to evaluate both nurse attitudes and trends in use and patient experiences of pain, anxiety, and satisfaction. A descriptive, quality improvement project following the Plan-Do-Study-Act format for healthcare improvement was conducted on a cardiac telemetry unit at a suburban hospital in Arizona. Thirty percent of staff nurses provided feedback. The majority of participating nurses had a bachelor's degree (58%) and less than 10 years of nursing experience (79%). Of the participating nurses, 79% recommended the intervention, with two fully providing the intervention to the patient when requested. Patient surveys were completed by 13% of potential patient participants, though only two surveys were suitable for analysis. Patients (n=2) reported improvements in satisfaction levels and would recommend the intervention for others. One reported an improvement in pain and the other patient reported an improvement in anxiety. Overall, music was viewed favorably by nurses and patients as a complementary therapy, but because of the short study period and limited nurse and patient feedback, more quality improvement projects are needed to determine its direct effects on patients. Engaging and recruiting frontline staff in the design of the project and enlisting more financial support from the organization would be advised.

INTRODUCTION

Cardiac surgeries are among the most frequently performed procedures in the United States. Coronary artery bypass graft (CABG) procedures are approaching 400,000 annually in this country (Centers for Disease Control and Prevention [CDC], 2015) while annual rates of aortic and mitral valve repair and replacement procedures are rising as well (Barreto-Filho et al., 2013; Gammie et al., 2009). Due to the critical nature of these procedures, patients are often confined to hospital rooms from three to over seven days postoperatively for close clinical monitoring. Exposure to equipment alarms, bright lights, painful and uncomfortable sensations, and a plethora of complex information during their time of recovery can disrupt the healing process and can induce stress, pain, and anxiety leading to a decline in immune functioning and recovery (DeKeyser, 2003). As a result, hospitalized patients (inpatients) may perceive the hospital environment negatively (Mazer, 2010). Inpatients place value on their immediate physical environments as it upholds the significance of well-being in their state of illness (Andrade, Lima, Pereira, Fornara, & Bonaiuto, 2013). Therefore, careful attention must be paid to maintaining a healing atmosphere for inpatients.

Music therapy is a complementary therapy that can be used alongside allopathic medicine for inpatients to provide comfort, release emotion, and even influence physiologic processes. Mazer (2010) suggests that in a state of illness, patients may rely on auditory sensations rather than visual to perceive their environments. As a bedside nursing intervention, music has been shown to reduce pain and anxiety levels and increase satisfaction with care in postoperative cardiac surgical inpatients (Bauer et al., 2011). This presents an opportunity to provide cardiac

surgical inpatients with music in an effort to improve satisfaction, uphold patient-centeredness, and promote health.

Background

Postoperative pain is the most common symptom experienced following cardiac surgery (Aslan, Badir, Arli, & Cakmakci, 2009). Physical pain upregulates the sympathetic stress response and can lead to complications such as delayed or impaired wound healing, deep vein thrombosis, coronary ischemia, pneumonia, and demoralization; imposing serious risk for this population (Apfelbaum, Chen, Mehta, & Gan, 2003; Kiecolt-Glaser et al., 1995). Anxiety is another common response to surgery and illness. A state of anxiety may arise as a result of uncontrolled pain in post-surgical patients and can lead to changes in sleep and appetite (Cutshall et al., 2011). Physiologic signs of anxiety can include increased blood pressure and heart rate (Rozanski, Blumenthal, & Kaplan, 1999). Inpatients who have experienced recent myocardial infarction may suffer further cardiac insult as a result of elevated blood pressure and heart rate secondary to increased anxiety (Huffman, Smith, Blais, Januzzi, & Fricchione, 2008). Preoperative anxiety is also correlated with higher postoperative pain in CABG patients (Nilson, Zimmerman, Barnason, Nieveen, & Schmaderer, 1998). The hospital environment can induce stress and anxiety even without the presence of pain, which can produce a compounding effect.

Uncontrolled postoperative pain can lead to additional use of analgesics and increased lengths of stay, though attempts to obtain accurate estimations of costs related to postoperative pain lack valid methodology (Bajaj, 2007). In the US, lost productivity and medical treatments for chronic pain, which occurs for some after open heart surgery, cost about \$635 billion per year (Institute of Medicine [IOM], 2011; Taillefer et al., 2006). Uncontrolled postoperative pain

may lead to additional costly diagnostic tests, treatments, and a longer length of stay, but estimations of cost related to unmanaged postoperative pain in cardiac surgical patients have not been directly evaluated.

A number of national organizations recognize the negative impact of pain on quality of life. The Office of Disease Prevention and Health Promotion (ODPHP) developed Healthy People 2020; a national health initiative that focuses on improving a variety of health indicators including health-related quality of life (HRQOL) and well-being (ODPHP, 2016). Measurement of HRQOL includes self-reported physical and mental health variables such as pain and emotional distress while techniques to measure physical, mental, and social well-being are still being designed (ODPHP, 2016). The National Institutes of Health (NIH) and the IOM are working together to create a National Pain Strategy which emphasizes self-management programs, new treatment methods, and improved collaboration between the care team and patient (NIH, 2015).

The Joint Commission (JC), an independent accreditation organization, has created standards of care pertaining to pain recognition, screening, and education in the hospital setting. Organizations may tailor its approach to pain management as long as the pain is treated or the patient is referred elsewhere for further pain assessment and management (JC, 2015). The JC also hopes to reduce opioid-related complications by emphasizing a multimodal approach to pain management (JC, 2012). Compliance is evaluated on an annual basis and it is the duty of each individual organization to uphold these standards.

Local Problem

There is a heightened focus on improving the patient experience and patient-centeredness within healthcare organizations. Yet, healthcare facilities repeatedly encounter difficulty in involving patients in decision making when it comes to quality improvement (Luxford, Safran, & Delbanco, 2011). Carol Cronin synthesized a list for the National Health Council of six components essential to patient-centered care, two of which are “sensitivity to nonmedical and spiritual dimensions,” and “respect for patient needs and preferences” (as cited by Shaller, 2007). Though efforts are being made to improve the inpatient experience at this suburban Arizona hospital, patient involvement is minimal. Complementary therapies as a means to uphold spiritual values are not routinely used, and individualized music interventions are not provided.

Purpose

The purpose of this Doctorate in Nursing Practice (DNP) project was to create and implement a new bedside music nursing intervention using the Plan-Do-Study-Act model for quality improvement, to evaluate trends in music utilization, and explore inpatients’ experiences of pain, anxiety, and satisfaction in the context of the intervention. The intended population included postoperative cardiac inpatients on the telemetry unit at a medium-sized suburban hospital in Arizona. In order to ascertain the feasibility of incorporating this intervention into the existing workflow, brief nursing input was required. Anticipated outcomes included successful implementation of the novel nursing intervention and improved inpatient perceptions of pain, anxiety, and satisfaction.

The decision to use music at the bedside for this population was based on a current lack of complementary therapies available at this facility in addition to the excellent safety profile and its ease of use. Cardiac surgical inpatients make up the majority of key stakeholders since the use of music has the greatest potential to affect their hospital experience. Staff nurses were responsible for facilitating music delivery and integral to the new process. Department directors, providers, and organizational leaders shared a vested interest in any potential improvements in patient satisfaction and salvaged healthcare costs.

Study Questions

This quality improvement project intended to answer the following questions:

- Are staff nurses utilizing the music intervention for postoperative cardiac surgical inpatients regularly?
- How many postoperative cardiac surgical inpatients use the music intervention during their hospital stay?
- When postoperative cardiac surgical inpatients are given the option to listen to music during their stay, what factors, including the presence of pain or anxiety, drive their decision?
- How satisfied were postoperative cardiac surgical inpatients with music selection, mode of delivery, and timing?
- Was there a decline in perceived pain and anxiety associated with music?

FRAMEWORK & SYNTHESIS OF EVIDENCE

Theoretical Frameworks

The holistic nature of a music listening intervention warrants a combination of a foundational nursing theory and a working theoretical framework. The goal of interaction of the inpatient with their hospital environment and nurse can be described using Kolcaba's Theory of Holistic Comfort which states that "(a) human beings have holistic responses to complex stimuli; (b) comfort is a desirable holistic outcome that is germane to the discipline of nursing; and (c) human beings strive to meet, or to have met, their basic comfort needs" (Kolcaba, 1994, p. 1178). This theory is central to the patient experience, the role of nurses in providing and facilitating comfort, and patients' strive for comfort.

This theory is attractive due to its cohesiveness with many organizations' missions and values (Kolcaba, Tilton, & Drouin, 2006). The selected hospital's mission includes community partnership to improve quality of life. Values pertain to respecting individuals, promoting collaboration, and strengthening teamwork (Dignity Health, n.d.). Patient-centered care remains the focus of both Kolcaba's theory and the organization's mission and values. March and McCormack (2009) framed the theory's application to healthcare and organization-wide practice, emphasizing a team approach to patient comfort. Figure 1 shows the conceptual framework for Kolcaba's theory meant to guide this project. The organization must encourage innovative best practice solutions and support measures directed at patient comfort and care in order to enhance the patient experience.

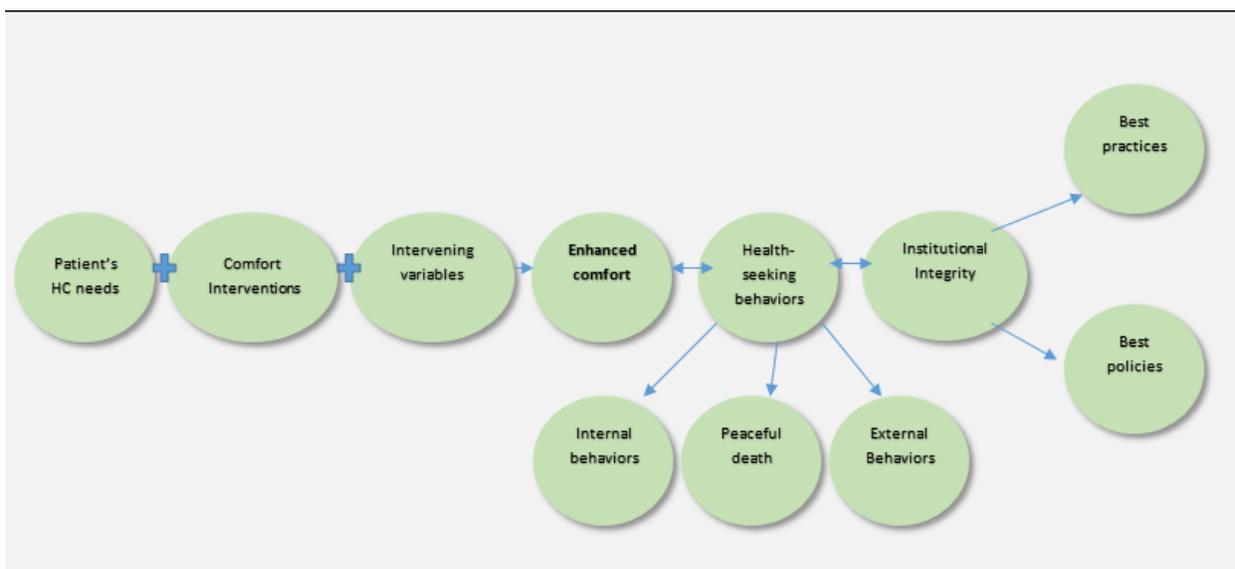


Figure 1. Katherine Kolcaba's Theory of Holistic Comfort Conceptual Framework. Reprinted from The Comfort Line. Retrieved February 25, 2016, from <http://www.thecomfortline.com/>. Adapted with permission.

The process of developing a program that is attuned to the patients' needs requires a Plan-Do-Study-Act (PDSA) framework to test the intervention and tailor it using patient and staff input. The Institute for Healthcare Improvement (IHI) developed the Model for Improvement which guides institutional change using PDSA cycles ("How to improve", n.d.). The model offers a stepwise process for systematically developing, implementing, and evaluating the effectiveness of a program intervention (see Figure 2). Steps in the *planning* phase include creating a goal, forming a team, setting aims, and determining measures of success (The W. Edwards Deming Institute [WEDI], 2016; "How to improve", n.d.). Next, the intervention is implemented in the *do* stage. The *study* stage involves evaluating barriers and successes while testing the original plan for validity (WEDI, 2016). Lastly, the *act* portion involves adjusting the existing process to make it more robust therefore influencing further cycles (WEDI, 2016). Eventually, each subsequent cycle functions stronger and more efficiently than the last

warranting a scale up or spread of the new change (“How to improve”, n.d.). Emphasis is placed on stakeholder input from the onset as well as real-time feasibility. Because music listening at the bedside creates a new, though minimally complex workflow shift, the intervention required testing on a small scale, as barriers could be encountered as a result of human factors and technology complexity. The benefit to using this healthcare improvement framework is that barriers can easily be identified, quantified, and rectified so that the intervention functions seamlessly. This framework also allowed the organization to make it evident to patients and staff nurses that music was available for their use and comfort and that their feedback will not only make their hospital stay more tolerable, but could improve the hospital experience for others.



Figure 2. Plan-Do-Study-Act Cycle. Adapted from The W. Edwards Deming Institute. (2016). The Plan, Do, Study, Act (PDSA) Cycle. Retrieved February 27, 2016, from <https://www.deming.org/theman/theories/pdsacycle>

In an effort to generate comparable data and to improve generalization in regards to music therapy, recommendations for music intervention quality and reproduction were developed (Robb, Burns, & Carpenter, 2011). These recommendations pertain primarily to scientific

research, but translating and applying the knowledge generated in the realm of music therapy required the use of these guidelines. According to the recommendations, details of a music program must include delivery mode, instrumentation, volume level, the type of musical content, methods to tailor the content to individual preference, by whom the music was selected, specific musical content citations, the duration and frequency of sessions, location of sessions, number of participants, interventionist specifications, and the particular music-based intervention strategy (Robb, Burns, & Carpenter, 2011). Controlling confounding variables were less restricted in this project since this was an attempt to determine practical applicability.

Concepts

Three phases, each representing the patient's state of comfort, are imbedded in Kolcaba's Theory of Holistic Comfort. *Relief* is the first phase in which the patient's immediate stressors are alleviated (Kolcaba, 1994). In this case, music was used as a nursing intervention for this purpose. The next phase is *ease*, pertaining to adequate relief and contentment (Kolcaba, 1994). Patients may request music at any time during their hospital stay, even if they do not seek relief of symptoms. Motivating factors for requesting music were evaluated and were expected to align with comfort-seeking behaviors. If ease and contentment persist, the patient could achieve a state of transcendence in which they feel ready and motivated to pursue and maintain their own health (March & McCormack, 2009). Figure 1 shows the gradual progression towards sustained and transcendental comfort proposed by Kolcaba's theory and furthermore the necessity of organizational support. Krinsky, Murillo, and Johnson (2014) were able to apply the Theory of Holistic Comfort to various scenarios involving cardiac inpatients by introducing the use of quiet time. Music, like quiet time, operates within the four contexts of physical, sociocultural,

psychospiritual, and environmental comfort (Kolcaba, 1994; Krisnky, Murillo, & Johnson, 2014). Nursing interventions aimed at relieving patients' pain and anxiety could lead to improvements in their overall hospital experience, perceptions of care, and personal wellbeing (Kolcaba, 2010; Krinsky, Murillo, & Johnson, 2014).

It is also important to note there is a key difference between *music therapy*, defined as “clinical and evidence-based use of music interventions to accomplish individualized goals within a therapeutic relationship by a credentialed professional who has completed an approved music therapy program”, and *music as a therapeutic intervention* at the bedside characterized by the use of music to affect physiologic and psychologic variables (American Music Therapy Association, 2014). The intervention described in this project was considered a therapeutic intervention as it was not be delivered by a credentialed music therapy professional. This process does not require a systematic process in delivery, but still produces beneficial sensations and experiences for the patient (Bradt et al., 2015).

Kolcaba's Theory of Holistic Comfort is uniquely fitting for complementary therapies, but because music listening differs significantly with the traditional Western biomedical approach typically utilized in acute care facilities, a PDSA framework for quality improvement will be ideal for incorporating such practice into daily hospital routines. Music integration as a part of postoperative care can offer the patient greater opportunities to advance their health and recovery.

Synthesis of Evidence

An extensive search of the literature was performed in order to identify gaps in practice and research pertaining to a music intervention. Databases employed for this review include

PubMed, PsychINFO, Cumulative Index of Nursing and Allied Health Literature (CINAHL), and Google Scholar. Search terms included a combination of *cardiac surgery*, *postoperative pain*, *anxiety*, and *patient satisfaction*, with *music* remaining constant. Other terms used to clarify the search included *heart surgery* and *inpatient*. Studies dating from 2006 to 2016 were included in this review as only five relevant studies were found in the last five years. Articles written in English and involving adult patients (age > 18 years old) were selected. After results relating to cardiac surgical patients were exhausted, focus was placed on cardiovascular inpatients and other inpatient surgical populations.

A total of 13 articles relevant to music listening in a hospital setting with outcomes related to pain, anxiety, and patient satisfaction were appraised (see Appendix A). Research articles reviewed included: randomized controlled trials (n=9), quasi-experimental studies (n=3), and a descriptive qualitative study (n=1). Two systematic reviews were examined but not appraised. Two studies pertaining to national patient satisfaction scores and music therapy for inpatients were discovered but not included as hospital satisfaction scores were not evaluated.

Study Characteristics

The majority of included studies (n=10) were conducted within the last five years. Thoracic surgical patients (CABG, aortic valve, mitral valve, combination) were the focus of most studies (n=9), while other populations studied included postsurgical knee arthroplasty, abdominal surgery, non-specified inpatients, and medical/surgical ward patients. In the instances where participant gender was reported, men often outnumbered women (Allred, Byers, & Sole, 2010; Bauer et al., 2011; Jose, Verma, & Arora, 2012; Liu & Petrini, 2015; Nilsson, 2009b; Özer, Karaman Özlü, Arslan, & Günes, 2013; Stein et al., 2010; Vaajoki, Pietilä, Kankkunen, &

Vehviläinen-Julkunen, 2012), though men and women were most often equally distributed among intervention and control groups with the exception of one study (Stein et al., 2010). The typical age range included those in their 50s, 60s, and 70s. Studies were most often conducted on clinically stable, cooperative, literate adult patients without psychiatric disorders, hearing deficits, or chronic pain.

Music Intervention Methods

Although several authors have found significant improvements in postoperative pain and anxiety scores with the use of a music intervention, there remains considerable variation among the methods of delivery. For instance, several researchers employed music listening with headphones (Allred et al., 2010; Bauer et al., 2011; Bhana & Botha, 2014; Jafari, Emami Zeydi, Khani, Esmaeili, & Soleimani, 2012; Jose et al., 2012; Liu & Petrini, 2015; Özer et al., 2013), while others used music pillows or loudspeakers (Nilsson, 2009a, 2009b; Weeks & Nilsson, 2011). Patients that listened to music via earphones and music pillows generally reported improvements in pain and anxiety compared to periods of quiet rest (Allred et al., 2010; Bauer et al., 2011; Jafari et al., 2012; Jose et al., 2012; Liu & Petrini, 2015; Nilsson, 2009a; Özer et al., 2013). Loudspeaker use was deemed disruptive to staff, though reports of patient anxiety levels were improved with either modality (Weeks & Nilsson, 2011). Stein et al. (2010) compared voice-guided relaxation with solitary background music, but did not observe any significant changes in mood compared to baseline in either group. This study lacked consistency because patients were allowed to listen to music at home using a method they preferred, controlling for which was impossible in spite of adequate instruction.

Music Selection

Music intervention characteristics varied considerably. Vaajoki et al. (2012) allowed patients to choose from a collection of 2000 pre-loaded songs with no restrictions in tempo, genre, or volume level. Interventions in other studies were pre-selected and typically adhered to combinations of moderately slow tempo (60-80 beats per minute), new age or calming music without lyrics or rhythms, and a low volume (50-60 decibels) (Bauer et al., 2011; Bhana & Botha, 2014; Jafari et al., 2012; Liu & Petrini, 2015; Nilsson, 2009a, 2009b; Özer et al., 2013; Weeks & Nilsson, 2011). Sessions that were 20 minutes long were acceptable (Bhana & Botha, 2014). In some instances, careful attention was paid to maintaining cultural sensitivity in music choice (Bhana & Botha, 2014; Jafari et al., 2012; Jose et al., 2012; Liu & Petrini, 2015; Özer et al., 2013).

A music intervention for postoperative cardiac patients is perhaps best performed in the intensive care unit immediately after surgery, as patients are more likely to experience distressing situations (Bauer et al., 2011; Bhana & Botha, 2014; Jafari et al., 2012; Liu & Petrini, 2015; Nilsson, 2009a, 2009b; Özer et al., 2013). Intervening in a home-based setting prior to elective surgery was ineffective in reducing incidence of depression or improving mood and anxiety (Stein et al., 2010). No studies were done on telemetry units and those done on other surgical and medical populations were performed on medical/surgical units.

Pain and Music

Statistically significant improvements in pain levels with music listening were demonstrated in the majority of studies reviewed with one reporting an almost 50% reduction in pain scores after music intervention (Allred et al., 2010; Bauer et al., 2011; Comeaux & Steele-Moses, 2013;

Jafari et al., 2012; Jose et al., 2012; Liu & Petrini, 2015; Nilsson, 2009a; Özer et al., 2013; Vaajoki et al., 2012). A survey revealed that 68% of its experimental group participants believed that music helped relieve their pain (Liu & Petrini, 2015). Music was sometimes cited as a distraction from the experience of pain (Allred et al., 2010). Extending the use of music over several episodes rather than a one-time intervention proved to be effective as well (Comeaux & Steele-Moses, 2013; Jafari et al., 2012; Nilsson, 2009a).

Anxiety and Music

Opposing results pertaining to anxiety and relaxation were reported. Liu and Petrini (2015), Nilsson (2009a), and Weeks and Nilsson (2011) found significant improvement in anxiety levels after listening to music, but non-significant reductions in anxiety were reported by others (Comeaux & Steele-Moses, 2013; Nilsson, 2009b). Up to 76% of the experimental group subjectively believed that music reduced their anxiety (Liu & Petrini, 2015). Additionally, Bauer et al. (2011) and Nilsson (2009b) found significant improvement in relaxation. Approximately 53% of patients exposed to a music intervention reported a positive influence of their sound environment on their well-being compared to 26% of the control group (Weeks & Nilsson, 2011). No instances of patient harm were reported among all studies. Though not a subjective measure of anxiety, oxytocin levels have been shown to increase while cortisol levels decrease after listening to music after cardiac surgery (Nilsson, 2009a, 2009b)

Satisfaction with Music

Patients were generally pleased with the music intervention and felt that their pain and anxiety improved after listening to music (Jose et al., 2012; Liu & Petrini, 2015). Additionally,

favorable attitudes towards music listening as a nursing intervention were demonstrated among nurses and physicians (Bauer et al., 2011; Jose et al., 2012).

Two studies not included in the appraisal involved the use of music therapy services instead of music as a nursing intervention (Mandel, Davis, & Secic, 2014; Yinger & Standley, 2011). Both studies demonstrated increases in patient satisfaction scores as evaluated using national patient satisfaction surveys, but correlating the intervention to broad-based scores was problematic (Mandel et al., 2014; Yinger & Standley, 2011). Comeaux and Steele-Moses (2013) attempt to conclude that pain management and environmental noise satisfaction improved using national patient satisfaction survey results as outcome measures. The inability to control for a multitude of confounding variables makes direct inferences about the effects of the intervention difficult.

Potential Barriers to Implementing Music as a Therapeutic Intervention

Patients acknowledged the need for improved coordination with nursing care and would have preferred more sessions (Bhana & Botha, 2014). The inability to adequately blind the participants and researchers to a musical intervention increases the risk of bias in such studies (Bradt & Dileo, 2013; Hole, Hirsch, Ball, & Meads, 2015). Care must be taken to ensure compliance with copyrighted musical materials (Hole et al., 2015). However, music is deemed to be a safe and inexpensive adjunct to standard postoperative hospital care in reducing pain, stress, and anxiety (Bradt & Dileo, 2013; Hole et al., 2015).

Research Gaps

The lack of quality improvement projects utilizing music to improve pain, anxiety, or patient satisfaction in postoperative cardiac surgical patients presents a gap in current knowledge

and practice. This collection of research studies indicates music's effectiveness and safety for use in a variety of patient populations and can be utilized in real-time practice settings.

METHODS

Design

Because the primary intent of this project was to develop, implement, and evaluate the use of music as a novel nursing intervention, a PDSA model was used to guide this quality improvement project. To explore the attitudes and perceptions of inpatients towards the intervention, descriptive analysis supplemented the intervention implementation in order to describe the patient experience. Non-experimental methods typically involve minimal, if any, manipulation of variables (Nieswiadomy, 2012). Survey studies in particular describe populations based on a variable and rely on self-reported data (Nieswiadomy, 2012). Directly measuring pain and anxiety levels would pertain only to the effectiveness of the intervention, neglecting the experience of the patient. Attitudes, perceptions, and opinions were gleaned from survey responses making surveys valuable in gaining feedback for program improvement (Nieswiadomy, 2012; Thayer-Hart, Dykema, Elver, Schaeffer, & Stevenson, 2010). Some quantitative data was collected to provide greater context for interpreting the survey questions relating to the music intervention. Nursing input was gathered throughout the PDSA process and used to provide context for the success or failure of the intervention course.

Plan

The first step in the PDSA cycle was the *planning* phase. In this phase, specific, measurable outcomes or aims are set, measures intended to show improvement are selected, and the change or intervention is decided upon ("How to improve", n.d.). The primary aim for this quality

improvement project was to observe at least 50% of cardiac surgical patients using the intervention within one month. The second aim was to have at least 50% of staff nurses on a cardiovascular telemetry unit recommending or utilizing music at least once as a nursing intervention by the end of a one-month period. The outcome measures included the number of nurses recommending or employing the intervention for patients and the number of patients offered music during their telemetry stay. Process measures considered the shift worked (day or night) and years of experience as a nurse. These process measures added context for inferring nurse work habits and likelihood to use the music which were valuable in adapting changes for future cycles. Daily shift meeting notifications and an information sheet on the benefits of music for these patients were considered change interventions designed to encourage the use of music and improve its use in clinical practice. Because of the relatively short implementation period, beginning with a small-scale unit (one nurse and one patient) was bypassed and the intervention was immediately available for use by all nurses on the unit. A preemptive email including the nursing information sheet and start date was sent to core staff members prior to implementation. Guidelines for correct implementation of the music intervention are described below.

Setting. The intervention took place on a 32-bed cardiovascular telemetry floor at a medium-sized suburban hospital in Chandler, Arizona. Hospital rooms at this facility are private, non-shared rooms allowing for greater autonomy and privacy. Participants were not allowed to listen to music during provider visits, therapy sessions, tests, procedures, or while off of the unit for any reason and were required to be in their own room while listening to music. Hourly rounding remained a standard of care at this hospital offering greater opportunity for patient-nurse interaction and the chance to routinely monitor and enhance the patient's environment.

Nurse buy-in and attitudes were expected to be the driving force of intervention implementation on this telemetry unit. Factors contributing to nurse participation included workflow, staffing ratios, workplace culture, and patient acuity.

Participants. A convenience sample of postoperative cardiac surgical patients made up a small-scale group of participants. There are approximately 15 to 20 cardiac surgical patients on this telemetry unit per month, half of which were projected to participate. Subjects must have been over the age of 18, alert and oriented to person, place, and time, cognitively capable of completing a survey, and have enough upper extremity dexterity and range of motion to put on and take off the music devices on their own. These criteria mean that data would only be collected on adult patients who are physically and mentally capable of self-motivated behaviors. Those who are blind, have difficulty seeing words on paper, or cannot read had the option to complete the survey with staff or family assistance. If a patient met the criteria and wished to proceed with the intervention, they were able to listen to music at their leisure and convenience without a defined time frame and were asked to complete the patient discharge survey before they left the hospital.

The other group of participants was comprised of staff nurses. Nurses were considered participants in this project as they were expected to deliver the intervention when requested and recommend the intervention to patients. Factors influencing the daily practice of these individuals were analyzed and evaluated to determine the effectiveness of the quality improvement process in facilitating delivery of the intervention to specific patients. Licensed practical nurses were not employed in this setting. Only registered nurses (RNs) were available to participate. Currently, travel, float pool, and non-cardiovascular nurses were not permitted to

care for these patients ensuring that only core staff would be recruited. Certified nursing assistants could inform the nurse when a patient requested music and if approved by the nurse, could employ the devices. Of the 70 registered nurses employed on the unit, approximately 50% of them were anticipated to utilize the intervention. Nurses were recruited by emailed disclosure forms and posted information sheets, and although their participation depended on their interest in the intervention and the feasibility of incorporating it into daily practice, participation was not mandatory. Nurses were responsible for ensuring the patient received a flyer upon arrival, checking out and returning the equipment using the activity log, weekly entries on the nursing intervention log, and responding on the weekly nursing feedback log.

Do

The second portion of the cycle was the *do* phase. At that point, the intervention was carried out and documentation of quality measures began. Data collection overlapped with the *study* phase of the cycle and continued throughout implementation. In this section, the music intervention and data collection tools were defined. Exploring patient and nurse perceptions throughout the project was integral to incorporating their perspectives in the development and planning of future improvement efforts and were discussed here.

Intervention. This intervention gave patients the option to listen to music as a recovery aid after open heart surgery. By recording information on either the check-out log or the nursing intervention log, it was presumed that the nurse had reviewed the project information sheet. The information sheet described the intent of the project, discussed expected outcomes, outlined acceptable patient demographics, and taught proper and safe use of the equipment. The information sheet was posted at various locations around the unit and at the charge nurses' desk.

This ensured that the intervention was carried out consistently and reliably. The information sheet can be found in Appendix B.

Upon arrival to the telemetry unit from the cardiovascular intensive care unit (ICU), patients received a flyer informing them of the option to use music during their continued recovery period as well as a disclosure form. Eligible patients on the unit at the start of the intervention period also received a flyer and disclosure form. Flyers were printed on colored paper stock and were posted in a visible location in the patient's room such as on the whiteboard or on their bedside table. The flyer can be found in Appendix C. The receiving staff nurse verbally mentioned the intervention to the patient upon their arrival. Nurses could then utilize the music intervention for patients that met the inclusion criteria and only for those who agreed to its use.

Patients chose from a variety of relaxing music preloaded onto mp3 player devices. Music selections generally adhered to a tempo of 60 to 80 beats per minute, lyric-less genres, and low volumes. Genre options included jazz, new age, country, Native American, East Asian, Indian, and Latin. There was no limitation on the length of time a patient choose to listen to music, allowing the patient optimal autonomy in utilizing the intervention. At least 15 mp3 players were needed to adequately provide the intervention to all open-heart surgery patients on the unit at a given time, but only five were purchased. The hospital's engineering department was asked to review the devices for safety prior to use. Nurses were instructed to disinfect each device after patient use using the appropriate cleansing agents recommended by infection control and return the devices to a dedicated storage location. Personal earbud headphones were provided and were not reused for subsequent patients which reduced the risk of spread of infection.

Resources needed to carry out the intervention included money for purchasing the music devices, headphones, songs, and copy paper for the logs, flyers, and surveys. Funding for this project was provided by the principal investigator. The unit and department directors were approached about providing the headphones and copy paper. A budget breakdown can be viewed in Appendix D.

Data Collection. Data collection was ongoing from day one until the final day of the intervention period. To observe discrepancies in nursing practice, all participating nurses would need to have marked a response on an intervention log once each week whether they had 1) recommended with use, 2) recommended without use, or 3) neither by the end of the data collection period. Contextual information including years of experience and highest degree received were also recorded on the nursing intervention log. Study codes generated by the nurses were used to ensure response privacy and to prevent duplicate responses. The intervention log can be found in Appendix E. Data from the logs was studied at the end of each week so that updates and improvements could be made and relayed to the nursing staff the beginning of the following week during the morning and evening meetings.

A form asking additional questions prompting nurses' feedback was placed in the breakroom and around the nursing unit (see Appendix F). This allowed nurses to provide guided, free-text input regarding the feasibility of the intervention in their daily practice as well as recommendations for improvement from their standpoint. Again, responses on any and all forms was not mandatory.

Nurses then recorded the dates and times when the music devices were used on a check-out log (see Appendix G). Trends in use were monitored with this tool and analyzed on a weekly

basis. For example, use may have been higher or lower on weekends or nights. Using the data of these three logs, improvements in the delivery of the intervention could be made continuously during the *act* phase.

All suitable cardiac surgical patients, whether they used the music or not, were expected to complete a survey regarding their experience immediately prior to discharge (see Appendix H). In order for surveys to adequately portray a phenomenon of interest, questions must be established as reliable and valid. Survey questions must be reliable in that it must be presented in a way that upholds the same meaning for all of those administering or completing it (Thayer-Hart et al., 2010). Surveys included a preamble explaining the response context and directions (Thayer-Hart et al., 2010). Since a premade survey pertaining to the patient experience portion of this project was not found, survey questionnaires were created by the principal investigator and evaluated by a PhD- prepared faculty member, two DNP-prepared administrative nurses, and a Masters level clinical nurse specialist. The intent was to attain face and content validity.

The estimated time to respond to the survey questions was approximately five to ten minutes or less. Responses were completely anonymous. The likelihood for duplicate responses was low since a single staff nurse was responsible for discharging their respective patients. Survey distribution began starting day one and ran for a minimum of one month. Data reported on the survey included demographics such as age, gender, and type of surgery. Subjective responses to Likert-scale questions pertaining to their experiences with pain, anxiety, and satisfaction were recorded as well as their impressions and rationale for using the music intervention. Likert scales are a common format for surveys and allows respondents to rank their experiences (Allen & Seaman, 2007). Those that did not use the intervention were asked to respond to the question

pertaining to their dissent on the survey. Because the survey was only used to reveal patient attitudes and served in no way to offer any type of diagnosis, a pain visual analogue scale was not used. Rather, a Patient Global Impression of Change Scale was used. Global rating of change scales have been found to be easy and simple to administer and interpret in clinical practice as well as reliable, valid, and sensitive to change (Kamper, Maher, & Mackay, 2009). Patient self-responses, however, are subject to recall bias leading to underestimation or exaggeration of their scores making it difficult to objectively measure change (Kamper et al., 2009).

Study

The *study* phase is synonymous with analysis and is a continuous phase in the PDSA cycle. At the end of each week, the three activity logs were analyzed for trends in nurse and patient use. Results were summarized and compared to the initial PDSA aims. Results of the patient survey were used to provide feedback to the nursing staff on their preferences and satisfaction.

Data Analysis. Data analysis consisted primarily of descriptive statistics as there was no attempt to determine any causal relationships. Statistical software such as SPSS was used to organize and interpret data. The success of the intervention relied on good nurse to patient communication and the help of visual reminders such as flyers. Ultimately, the intervention remained optional and patient motives for requesting or declining to listen to music varied. Descriptive statistics summarize data and examine participant characteristics, experiences, and behaviors (Nieswiadomy, 2012). A simple bar graph can show comparative data for each of the three variables presented on the initial nursing intervention log as well as ordinal data from the Likert scale survey questions. A frequency distribution visually represents the number of occurrences for a given response and was used to determine whether nurses were routinely

utilizing the intervention with their patients (Nieswiadomy, 2012). Measures of central tendency were used to analyze demographic characteristics and rationale for requesting music as reported on the surveys. Content analysis was used to evaluate free text responses from the nurse feedback log and the patient surveys.

Act

Each week, data analysis results were shared in pre-shift meetings in an effort to improve intervention utilization with the intention of reaching the initial goals. The information attained at this stage was then used to plan any changes or improvements to the existing processes. Ultimately, prolonged and consistent use of the intervention was the goal of quality improvement endeavors.

Ethical Considerations

Only a few ethical considerations needed to be addressed. According to the Belmont Report released by the Department of Health, Education, and Welfare (1979), research and practice occasionally need to be delineated, but can occur concurrently. Music intervention at the bedside is freely permitted for any patient or family to bring from home and is not contraindicated or unsafe for most patients. In this case, the music intervention was considered part of a quality improvement project intended to improve an existing practice issue and was not considered research on human subjects.

Autonomy was preserved in this project as patients were not required to utilize the music intervention. Patients and nurses were given a disclosure statement to inform them of the project's intent (see Appendices I and J). The primary aim was to determine whether patients decide to use the intervention, how often, and for what purpose (eg., to relieve pain or anxiety, to

pass time, to relieve nausea, to create a comfortable environment, distraction). Vulnerable populations include those with poor cognition, mental disability, complete immobility, prisoners, or other limitations in making their own decisions. These patients were not included or offered music as the intervention had not been studied in these populations. Education was provided to nurses regarding these limitations via an information sheet posted next to the check-out logs.

Subject privacy was maintained since there was no need to access the medical record and direct measurements were not recorded. Personal identifiers were not collected from anyone in any form. Nurses created their own study codes by combining the first two letters of their mother's name, the two-digit day of the month they were born, and the last letter of their first name and used it to record data on logs. Surveys gathered information on patient demographics such as age, gender, and type of surgery and were stored in an opaque folder in a locked drawer near the charge nurse's desk. Nurse recommendation logs asked for variables including highest educational degree received and years of experience.

There was little to no risk of harm with this activity. Autonomous patients could remove the headphones if uncomfortable. Nurses assisted the patient adjust the volume to their level of comfort, while standard hourly patient rounding ensured frequent monitoring. Expected benefits included improved perceptions of pain, anxiety, relaxation, and patient satisfaction.

To ensure justice, inclusion and exclusion criteria were fair and did not exclude individuals for which there may be evidence of benefit. There were no restrictions on ethnicity, gender, payment ability, sexual identity, or language. Since the unit where the project occurred is an adult unit, pediatric patients (under 18 years old) were excluded. There were no other age restrictions.

RESULTS

Approval was granted by the hospital's Institutional Review Board and ceded IRB oversight was granted by the University of Arizona (see Appendices K and L). Once approved, an email was sent to the unit's staff, supervisor, and director three days prior to the start date informing all individuals of the nature of the project including all relevant study materials, disclosures, and instructions. Information sheets, disclosure forms, and data log sheets were posted in visible areas of the nursing unit. A drawer near the charge nurse desk was labeled and used to store the music players, headphones, patient surveys, and extra data log sheets. Prior to the intervention period, the mp3 players were cleared by the biomedical engineering department as safe for patient use. The intervention period began May 1st and ended May 27th. Data sheets and patient surveys were analyzed each week and feedback was relayed to the nursing staff during at least one morning and evening bed huddle meeting and in a weekly email update.

Nurse Data

A total of 19 individual nurses out of a total 63 core staff nurses (30%) participated by providing data on the nursing intervention log during the entire four-week study period. The majority of participants had 10 years or less experience as a registered nurse (see Figure 3). Of those who participated, 13 nurses recommended the music intervention without the patient utilizing it; most of them being bachelors-prepared nurses (see Figure 4).

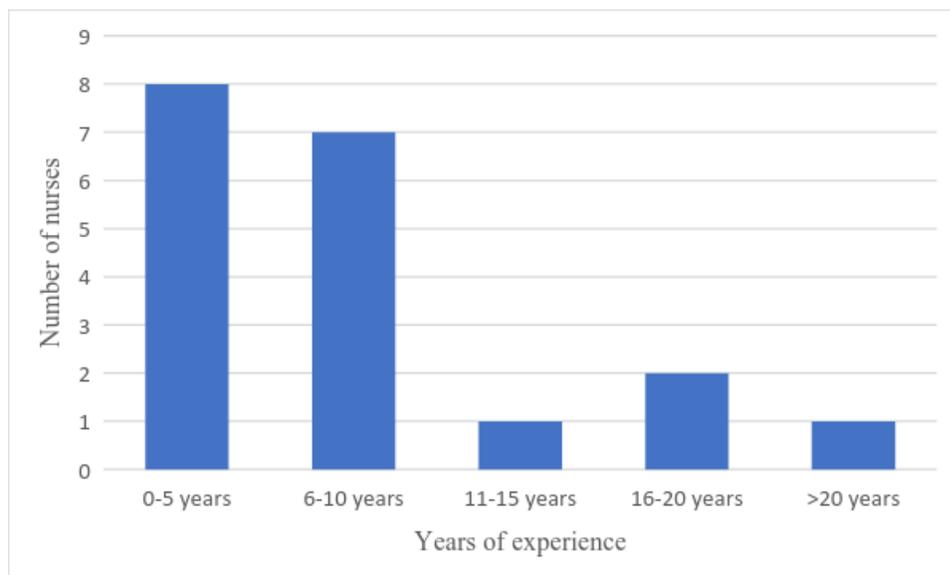


Figure 3. Years of Experience Working as a Nurse

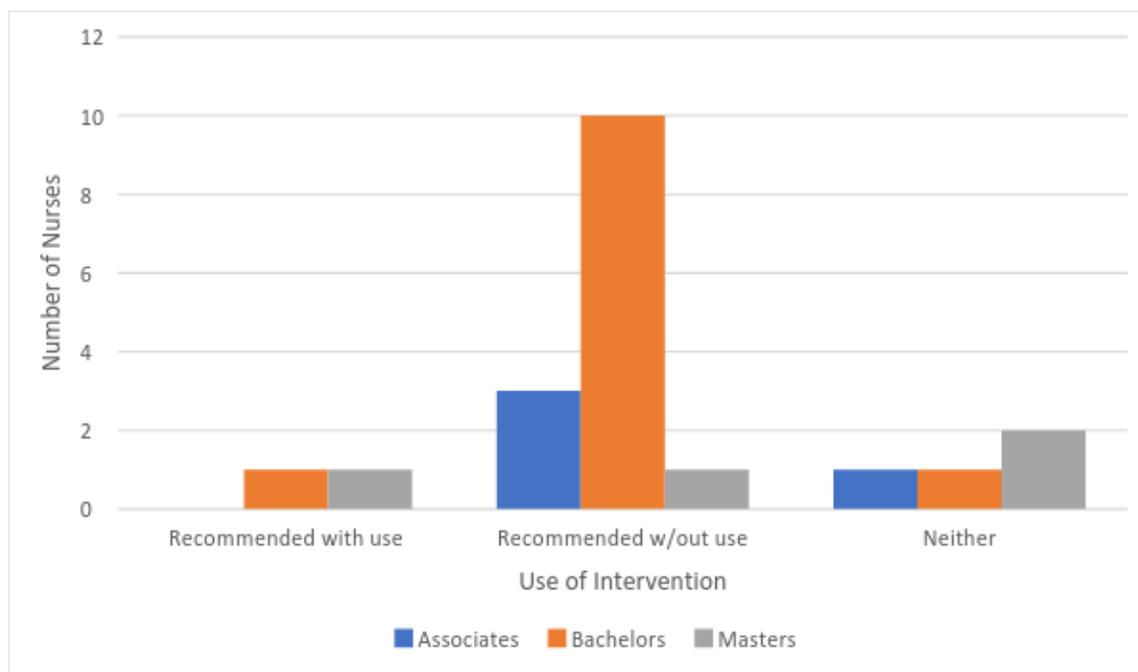


Figure 4. Nurses' Level of Education and Level of Participation

Participation during the first week was minimal with two nurses reporting data on the intervention log. During week two, four nurses reported their participation. Eight nurses reported

participating during week three and two nurses logged participation during week four. Four nurses reported having neither recommended nor used the intervention. One nurse reported recommending the intervention with patient use during the first week and recommending the intervention without use on a separate occasion. See Figure 5 for details.



Figure 5. Trend in Nurse Participation

According to the checkout log, a total of three mp3 players were checked out during the day shift only; one during the first week and two during the third week of the study period. There was only record of one mp3 player being returned, though out of five mp3 players, three were recovered at the end of the study period. Two devices were either lost or taken from the hospital. One nurse that checked out a device did not provide input on the intervention log.

Positive comments on the weekly nursing feedback log stated that the devices were easy to use, that the variety of songs was acceptable, and that the intervention gave the patient a new focus during their hospital stay. Two nurses stated their support for using alternative methods of

pain management, mentioning the ability of the intervention to distract from the hospital environment and to reduce the number of narcotics prescribed. In contrast, other nurses stated that the patient did not like the music options, that finding the power button on the device was difficult, and that some patients found out about the intervention too late during their hospital stay. One nurse expressed confusion with completing the nursing intervention log. A recommendation was made to improve the intervention by providing separate nurse and patient folders and making the intervention more visible and apparent to both nurses and patients, though this information was provided during the last week of the intervention period.

Patient Data

Total cardiovascular service line census data revealed that there was a total of 23 open-heart surgical patients on the unit postoperatively during the study period. Patient participation was 13% (n=3). Only three patient surveys were collected during the four-week study period.

Data interpretation was weakened due to several incomplete responses observed on the surveys. Participants included a 43-year-old coronary bypass patient, a 71-year-old male bypass patient, and a 74-year-old female bypass and aortic valve replacement patient. All three respondents were offered music, but only two reported listening to music. One survey indicated that a staff nurse recommended the intervention. The patient that declined the intervention proceeded to complete the survey despite the written instructions. Their rationale for declining was “discharged”. Post-surgical patient experiences varied somewhat, with only one reporting postoperative anxiety. There was some reported difficulty in operating the mp3 player, but generally, listening to music was beneficial in creating a better hospital experience. Responses from the patient survey are shown in Table 1.

Table 1

Patient Survey Responses Regarding Music Utilization and Perceptions After Heart Surgery

	Experienced pain	Experienced anxiety	Satisfied with music	Easy to use	Improved hospital experience
Strongly disagree	0	1	0	0	0
Disagree	0	0	0	1	0
Neutral	0	0	0	0	0
Agree	0	0	0	0	0
Strongly agree	2	1	2	1	2

Note. Numbers represent total number of responses. N=2 (Survey respondents)

In regard to the symptoms each patient experienced, both reported experiencing relief of their anxiety while feeling satisfied with their overall hospital experience in relation to the use of therapeutic music (see Tables 2-4). An inconsistency was noted in the responses of one patient when they indicated not experiencing anxiety after surgery but reporting a resolution in anxiety with regard to music.

Table 2

Impact of Therapeutic Music on Pain

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No change in pain	1	50.0	50.0	50.0
	Pain is resolved	1	50.0	50.0	100.0
	Total	2	100.0	100.0	

Table 3

Impact of Therapeutic Music on Anxiety

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Anxiety is resolved	2	100.0	100.0	100.0

Table 4

Impact of Therapeutic Music on Hospital Satisfaction

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Completely satisfied	2	100.0	100.0	100.0

Rationale for utilizing the music intervention during the patients' hospital stay included to reduce anxiety, to pass time, and as a distraction. Both respondents indicated that they would recommend the intervention for other cardiac surgical patients. There were no free-text suggestions for improvement documented on the patient surveys.

After the intervention period was over, results were shared with the cardiovascular supervisor and the intervention was offered for continued use.

DISCUSSION

This therapeutic music project was intended to explore perceptions of pain, anxiety, and the hospital experience related to the use of music after open-heart surgery. Although there were only two patient respondents, impressions of using music as an adjunct to standard pain management in the postoperative period were favorable for both patients and staff nurses.

Observations and data collected during this quality improvement project demonstrated that nurses' participation and engagement with music as a nursing intervention was less than expected. Level of education and years of experience were analyzed as possible influences on practice adoption and utilization, but did not reveal any meaningful differences. It is difficult to ascertain the patients' true interest in the intervention as the nurses were responsible for informing them of its availability during their hospital stay. Many eligible patients were uninformed and did not receive a survey on their day of discharge; a duty also delegated to the bedside nurse. Two patients did opt to utilize the intervention during their stay, with both reporting perceived improvements in their anxiety level and one reporting relief of pain. Patient feedback was positive in that those individuals would recommend the intervention to other open-heart patients. Additionally, nurses generally favored the music intervention as an adjunct to standard pain management. Since there were so few patient responses, much of the focus shifted to exploring barriers to implementation in practice.

Quality improvement projects investigating open-heart patients, their pain and anxiety perceptions associated with therapeutic music, or feasibility of implementation on a telemetry unit were not encountered in a search of available literature. Furthermore, this was a unique attempt to glean insight into the staff nurses' ability to incorporate the intervention into bedside practice. Wilkins and Moore (2004) conducted a quality improvement project to evaluate the efficacy of music to positively influence physiologic parameters of ICU patients after listening to music. The study did not report data pertaining to workflow and nurse input; a key element in mobilizing the intervention to the patient where its effects can be observed. However, they emphasized the importance of relying on organizational quality monitoring which, due to a short

study period and limited resources, was not possible. Organizational support was also imperative to implementing a therapeutic music program at a Kaiser Permanente hospital as Greve (2013) explains. In the study, investigators approached senior leadership as well as a patient advisory committee prior to implementing a costly music service intended for use in the halls and on the phone system. Results from the current study is consistent with Greve's (2013) as patients valued the music experience and wished to see the program continue. Though, due to the brief and limited scope of this quality improvement project, HCAHPS were not a viable outcome measure as in the Kaiser study.

Halpin, Speir, CapoBianco, and Barnett (2002) implemented a guided-imagery program for preoperative and postoperative open-heart patients. They utilized a multidisciplinary team to oversee and design the program and hired a specialist in guided imagery while adhering to a PDSA-like model of quality improvement. Data collection included a patient questionnaire (given at outpatient follow-up) to evaluate the intervention's effects on pain and anxiety. However, in order to have gathered survey data in the outpatient setting, extensive support from the cardiovascular surgeons and their office staff would have been necessary. Patient satisfaction and cost data were also analyzed. Because patient satisfaction scores are compiled based on each unit's individual performance, determining the direct impact of the music intervention on open-heart patients alone would be difficult. Patients were visited daily by the imagery team and encouraged to continue using the tapes provided even after discharge. The presence of a multidisciplinary team to ensure continued compliance with the intervention prior to and during the patients' hospital stay would imply a change in workflow and budgeting of time and cost; a change that would have been best supported by executive leadership. Extending the study period

to a year, as in the study by Halpin et al. (2002), would be unnecessary as the quality and quantity of data necessary for this project was less extensive.

Strengths

The strengths of this quality improvement project demonstrate the safety of the intervention and positive impact on hospital satisfaction. There were no reported adverse effects which was consistent with the literature. Nurses seemed accepting of using music at the bedside as a means to reduce opioid use postoperatively and to support the patient in a non-pharmacologic way during their recovery. Additionally, the intervention was low cost and could easily be used in other hospital units and departments.

Limitations

Generalizability of this quality improvement project is hampered due to the small patient sample size, small nurse sample size, relatively short study period, unit culture, and organizational practices and priorities. The number of nurses recruited was relatively low, though weekly efforts were made to inform all staff of the intervention and the progress of the project. Direct correlations between music use and perceptions of pain and anxiety were not possible as the survey was administered at a point when the patient may have forgotten their immediate response to the music and during discharge when other more pressing matters were at hand. The nature of exploring perceptions rather than objective, measurable data means that patient and nurse feedback could be a result of acquiescence bias where participants tend to respond how they believe the investigators want them to. However, patient satisfaction scores are based on perceptions and are valuable in hospital quality reporting.

Since the number of staff nurses outnumbered the quantity of open-heart patients on the unit for the month, it would be helpful to know the number of nurses caring for eligible patients each day. Additionally, determining the number of patient days rather than the quantity of patients on the unit would be helpful during data analysis. Up to 20 nurses care for patients on the cardiovascular unit during a 24-hour period. Any given day, there could be one open-heart patient that remains on the unit for about several days.

Staff nurse participation could have been influenced by whether they regularly read the weekly email updates or were present during shift meetings. Every effort was made to present weekly findings at multiple meetings each week when both day and night shift nurses were present. Additionally, the term “mp3 player” may have been unfamiliar with some patients and nurses and could have added to confusion.

When considering the organizational impact of a quality improvement project, data pertaining to cost, length of stay, and patient satisfaction are of utmost importance as this will ensure administrator support and sustain changes to the practice environment. Although the unit supervisor and telemetry director were verbally supportive of the project, there was little organizational support. Low-cost study materials and mp3 players were personally provided in order to appeal to stakeholders and abide by the values of the organization. Support by the cardiovascular surgeons was not sought. Cost and patient satisfaction data could not be tied directly to the cardiovascular surgery service line since these measures pertain to the unit as a whole and patients with varying admitting diagnoses were also present.

Process measures such as creating a study code did not appear to create any difficulty. The process of checking out the devices, cleaning them, and returning them, as well as recording

feedback on the data sheets was to be outside the regular duties of the staff nurses which may have led to reduced nurse participation.

Impact of Results on Practice

The workflow did not appear to be altered by the introduction of the music intervention; a desirable outcome. However, the utilization of the intervention declined during week four potentially showing a decline in interest. At this point, several other factors would need to be addressed in order to support the sustainability of the intervention including greater engagement of leadership and front-line staff to help facilitate its use for other patient populations in the hospital. It did, however, increase awareness of an alternative to standard pharmacologic therapies.

Future Implications for Practice

In continuing the use of music for patients at this hospital, recruiting front-line staff for the design of the intervention would increase staff engagement and buy-in. To scale up the intervention for other units, and to improve its utilization on the cardiovascular unit, it would be best to present the intervention at a local or department-wide staff meeting prior to implementation. Providing an in-service to allow the staff to manipulate the music devices and sample the music prior to patient use could improve participation. Generating a support base that includes the department director as well as multiple cardiovascular surgeons could improve patient participation and staff recruitment by appealing to quality measures and patient satisfaction.

Combining efforts with other teams involved in quality improvement projects can ensure sustained use. For instance, this project can be combined with efforts to reduce noise and

enhance quiet measures. It would also be good fit for the organization's remodeling efforts to improve the hospitals aesthetics.

Dissemination

Results of this study will be emailed to the staff, presented at the next department-wide staff meeting, and sent to the ICU director for their consideration. Due to the limited generalizability of this study, peer-reviewed publication will not be sought. Instead, an abstract will be provided to the hospital organization's research newsletter.

Conclusions

Music as a therapeutic nursing intervention was favored by both open-heart patients and the staff nurses. Pain, anxiety, and hospital experience were influenced positively by listening to music. However, the limitations of the project make the results scarcely generalizable. A longitudinal, larger scale quality improvement project with comprehensive organizational support and more tangible measures is warranted. Other units such as preop and the ICU may benefit from music given the abundance of relevant literature. Insight into the culture of the unit on which the intervention is used would be helpful in influencing practice change and improving the feedback process. Despite these limitations, music itself remains a safe, easy to use, low-cost adjunct to the standard of care in the postoperative management of cardiac surgical patients.

APPENDIX A
LITERATURE APPRAISAL TABLE

APPENDIX A

LITERATURE APPRAISAL TABLE

Author / Article	Research Question	Theoretical Framework	Design	Sample (N)	Data Collection (Instruments/tools)	Findings
Allred, K. D., Byers, J. F., & Sole, M. L. (2010). The effect of music on postoperative pain and anxiety. <i>Pain Management Nursing</i> , 11(1), 15-25.	To determine if music and/or quiet rest prior to first ambulation on postoperative day 1 reduces pain and anxiety	None noted	Randomized controlled trial	<p>Sample: N= 56 total knee arthroplasty patients distributed equally among groups</p> <p>Men: 25 Women: 31</p> <p>Age range: 46-84 years</p> <p>Exclusion: non-English speaking, hearing deficits, disoriented, psychiatric disorder, hemodynamically unstable</p>	<p>Measures:</p> <ul style="list-style-type: none"> - Pain - Anxiety - Blood pressure - Heart rate - Oxygen saturations - Opioid consumption <p>Instruments:</p> <ul style="list-style-type: none"> -Visual analog scale (VAS) for pain and anxiety -The McGill Pain Questionnaire -Physiologic parameters via portable bedside monitor -A 4-question Likert experience survey 	<p>-Significant differences in pain ($p=.001$), anxiety ($p=.011$), and mean arterial pressure (MAP) ($p=.000$) before and after physical therapy session for both groups</p> <p>-No significant differences in pain ($p=.337$), anxiety ($p=.206$), MAP ($p=.658$), heart rate, respiratory rate, or oxygen saturation between the experimental and control groups</p> <p>-93% of experimental group received opioids within 6 hours compared to 86% of quiet rest group</p> <p>-84% reported music helped them forget about their pain</p>

				<p>Intervention: -20 minute period -CD and headphones -60-80bpm -No lyrics -Soothing music</p> <p>Setting: Florida hospital orthopedic unit</p>	<p>Data Analysis: -RMANOVA used to determine differences in pain and anxiety scores and physiologic parameters over time; Bonferroni correction between time intervals</p> <p>-Chi-squared test to determine difference in oral pain medication administration</p>	<p>-92% reported improvement in mood -88% reported music as an enjoyable experience</p> <p>None reported a preference for having not listened to music</p>
<p>Bauer, B. A., Cutshall, S. A., Anderson, P. G., Prinsen, S. K., Wentworth, L. J., Olney, T. J., . . . Kelly, R. F. (2011). Effect of the combination of music and nature sounds on pain and anxiety in cardiac surgical</p>	<p>To determine the effect of music and nature sounds on pain and anxiety in cardiac surgery patients</p>	<p>None noted</p>	<p>Randomized controlled trial</p>	<p>Sample: N=100 Men: 77 Female: 23</p> <p>CABG or valve patients</p> <p>Stratification of sample based on baseline pain ratings</p> <p>Exclusion: intubated, chronic pain, psychiatric</p>	<p>Instruments: VAS administered orally by coordinator for pain, anxiety, and satisfaction</p> <p>Coordinator-measured blood pressure and heart rate</p> <p>Data Analysis: Descriptive statistics for continuous variables (pain, anxiety, relaxation, blood pressure, heart rate, opioid use)</p>	<p>- Age greater in experimental group (65 years old vs. 60 years old)</p> <p>-Decreased in pain scores on day 2 of intervention ($p=.001$)</p> <p>-Improved relaxation scores on day 2 of intervention ($p=.03$)</p> <p>-Non-significant decrease in anxiety (and opioid use and increase in satisfaction)</p>

<p>patients: a randomized study. <i>Alternative Therapies in Health & Medicine</i>, 17(4), 16-23.</p>				<p>disorder, hearing impairment, non-English language speaking</p> <p>Intervention: -Morning and afternoon -Postop day 2-4 -Choice of 4 compact discs (CDs) -20 minutes twice daily</p> <p>Setting: Cardiovascular ICU and progressive care units at a Minnesota hospital</p>	<p>Between group analysis: two-sample t test or Wilcoxon's rank sum test</p> <p>Age adjustment made</p>	<p>-Diastolic BP decreased on day 4 for experimental group</p> <p>-Qual. Observations: Receptive participants; music from home; multiple interruptions; receptive nurses</p>
<p>Bhana, V.M., & Botha, A.D.H. (2014). The therapeutic use of music as experienced</p>	<p>To describe the music listening experience of cardiac surgery</p>	<p>None noted</p>	<p>Explorative, descriptive, and contextual qualitative study</p>	<p>Sample: -Purposive sampling (non-random) -N= 9</p>	<p>Data Analysis: -Transcribed interviews -Content analysis and coding</p>	<p>Themes: -Music characteristics: relaxing, nice, calming</p>

<p>by cardiac surgery patients of an intensive care unit. <i>Health SA Gesondheid</i>, 19(1), 1-9. doi:10.4102/hag.v19i1.684</p>	<p>patients in the ICU</p>			<p>-Age: 30-70 years old</p> <p>-1-6 music sessions provided</p> <p>Exclusion: disoriented, not willing, unable to speak/read English; younger than 18, hearing disability, clinically unstable</p> <p>Intervention:</p> <p>-Pre-selected relaxation musical options offered</p> <p>-Compilation CD</p> <p>-CD/mp3 player with headphones</p> <p>-20 minute period</p>	<p>-Chosen according to mood and physical status (lack of sleep; nausea)</p> <p>-Session of 20 minutes was long enough for most</p> <p>-Some preferred more sessions</p> <p>-Need for better coordination with nursing care</p> <p>-Distraction from uncomfortable sensations</p>
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				-adjustable volume -Strict timing of sessions Setting: -ICU in a South African hospital		
Comeaux, T., & Steele-Moses, S. (2013). The Effect of complementary music therapy on the patient's postoperative state anxiety, pain control, and environmental noise satisfaction. <i>MEDSURG Nursing</i> , 22(5), 313-318	To examine the effect of music on postoperative pain, anxiety, and environmental noise perception	Relationship-based Care model	Quasi-experimental non-equivalent control group design (Hallway A= control; hallway B= intervention)	Sample: Intervention: N= 19 Standard care: N= 22 -Adult patients with a hematology/oncology diagnosis -Exclusion: LOS < 3 days, disoriented, <18 years old, unable to read/write English, no hematology/oncology diagnosis Intervention:	Measures: <ul style="list-style-type: none"> - Anxiety - Postoperative pain - Environmental noise perception Instruments: <ul style="list-style-type: none"> -State-Trait Anxiety Inventory (STAI) -National patient satisfaction survey questions regarding pain control and noise level (Likert scales) Data Analysis: <ul style="list-style-type: none"> -Descriptive statistics -Paired t-test within group differences -Independent t test for between group 	-Significant reduction in pain (P< 0.0001) and noise satisfaction (p= 0.001) one day after initial intervention -Significant improvement over time in pain management and environmental noise satisfaction (p< 0.001; P< 0.001) -No change in anxiety between groups or over time (p= 0.711)

				-30 minute period Setting: -Hospital surgical ward (non-ICU)		
Jafari, H., Zeydi, A.E., Khani, S., Esmaceli, R., & Soleimani, A. (2012). The effects of listening to preferred music on pain intensity after open heart surgery. <i>Iranian Journal of Nursing and Midwifery Research</i> , 17(1), 1-6.	Determine effects of preferred music on pain intensity alone after cardiac surgery	None noted	Randomized controlled trial with blinding	Sample: -N= 60 Control= 30 (Headphones with no music) Intervention= 30 Exclusion: ventilated, psychiatric disorder, chronic pain, hearing disorders, use of narcotic drugs in ICU, hx of playing music or other alternative therapies, and	Measures: - Pain intensity Instruments: - Numeric rating scale for pain Data Analysis: -SPSS -Descriptive statistics for demographics -Chi-square test for qualitative info -student's t-test for quantitative differences between groups -RENOVA for impact over time Power= 80%	-56.6% female -Mean age 57.83 -91.7% of participants underwent CABG (evenly distributed among groups) -Significant reduction in pain intensity over time (p<0.0001)

				<p>use of balloon pump</p> <p>Intervention: -headphones and MP3 player -30 minute period -60-80 bpm -POD 1 -Evening</p> <p>Setting: -ICU at Mazandaran Heart Center, Sari, Iran</p>		
<p>Jose, J., Verma, M., & Arora, S. (2012). An experimental study to assess the effectiveness of music therapy on the post operative pain perception of patients</p>	<p>To determine the effects of music on pain, BP, and HR in cardiac surgical patients while exploring attitudes of patients and staff</p>	<p>General system theory by Ludwif von Bertalanffy</p>	<p>Randomized experimental pretest posttest design</p>	<p>Sample: N= 60 Male: n= 36 Female: n=24 Age range: 15-78</p> <p>Intervention: -validated CD -mp3 player and headphones</p>	<p>Measures:</p> <ul style="list-style-type: none"> - Pain - Blood pressure - Heart rate - Patient opinions - Nurse/physician opinions <p>Instruments: -Numeric rating scale -Opinionnaire of 15 statements -Attitude scale</p>	<p>-Majority aged 15-30 (n=23) and 31-46 (n=22)</p> <p>-Significant decrease in pain, BP, and heart rate in intervention group (p values not reported)</p> <p>-Participants concurred that music is soothing and improves pain and mood</p> <p>-Majority stated music did not help them sleep</p>

<p>following cardiac surgery in a selected hospital of New Delhi. <i>International Journal of Nursing Education</i>, 4(2), 198-201.</p>	<p>regarding music</p>			<p>-20 minute period -culturally appropriate music</p> <p>Setting: -Postoperative ward CTVS department</p> <p>-Safdarjung Hospital, New Delhi</p>	<p>Data Analysis: -Descriptive statistics -Not otherwise specified between group analysis -Significance set at $p=0.05$</p>	<p>-80% of both nurses and physicians report moderate favorable attitude; 20% reported highly favorable attitude</p>
<p>Liu, Y., & Petrini, M.A. (2015). Effects of music therapy on pain, anxiety, and vital signs in patients after thoracic surgery. <i>Complementary Therapies in Medicine</i>, 23(5), 714-718. DOI:</p>	<p>To evaluate if music is effective in improving postoperative pain, anxiety, and vital signs after thoracic surgery for Chinese patients</p>	<p>Analgesia and side effects balance</p>	<p>Randomized controlled trial with repeated measures</p> <p>No blinding</p>	<p>Sample: Convenience sample</p> <p>N= 112</p> <p>Male: n=65 Female: n=33</p> <p>Intervention group N= 47</p> <p>Control group: N= 51</p> <p>Exclusion: non-thoracic surgery</p>	<p>Measures:</p> <ul style="list-style-type: none"> - Pain intensity - Anxiety - SBP, DBP, HR, RR - Diclofenac suppository use - PCA use <p>Instruments:</p> <ul style="list-style-type: none"> - FACES pain scale - State-trait anxiety inventory (STAI) - Vitals machines 	<p>-Mean age: 54.45 experimental; 52.02 control</p> <p>-Significant difference between groups for pain ($p= 0.019$), anxiety, SBP, & HR</p> <p>-No difference in DBP, RR, diclofenac, and PCA use ($P= 0.59$)</p> <p>-89.4% enjoyed the music -68.1% believed music relieved their pain -76.6% felt music decreased anxiety</p>

10.1016/j.ctim.2015.08.002				<p>patients, <18 years old, unable to read and speak Chinese, disoriented, hearing deficits, emergent surgery</p> <p>Intervention: -POD 1, 2, and 3 -Listened for 30 minutes -60-80bpm -mp3 players with earphones -Soft music (not otherwise specified)</p> <p>Setting: -ICU</p>	<ul style="list-style-type: none"> - Participant survey <p>Data Analysis:</p> <ul style="list-style-type: none"> - SPSS - Chi-square for between group differences and demographics - Participant characteristics: descriptive statistics - Independent t test for differences from baseline - Repeated measures analysis of variance (RENOVA) for anxiety - Marginal modeling (GEE analysis) for changes over time 	
Nilsson, U. (2009a). The effect of	To determine the effect	None noted	Randomized controlled trial with	Sample: N=58 (n=28 in music group)	Measures: <ul style="list-style-type: none"> - PaO2 - SaO2 	-Mean age music group= 64; control group= 69

<p>music intervention in stress response to cardiac surgery in a randomized clinical trial. <i>Heart & Lung</i>, 38, 201-207.</p>	<p>of music and bed rest on physiologic and psychological stress on postoperative cardiac surgical patients</p>		<p>repeated measures</p>	<p>CABG and aortic valve patients</p> <p>Exclusion: emergent surgery, surgery started after 12pm, previous cardiac surgery, corticosteroid treatment, balloon pump or pacemaker, hearing impairment, poor cooperation, involved in other studies</p> <p>Intervention: -Music pillow mp3 player -60-80 bpm -30 minute period -50-60 dB -New-age style</p>	<ul style="list-style-type: none"> - Serum cortisol - HR - BP - MAP - Respiratory rate - Pain level - Anxiety level <p>Instruments: -Arterial blood gases -Vital monitors -Numeric rating scales</p> <p>Data Analysis: -SPSS</p> <p>-Chi-square and Fisher exact tests for differences between groups for surgical factors, oxygen consumption, and analgesia</p> <p>-Fisher exact test for between group MAP, HR, RR, PaO₂ and SaO₂</p>	<p>-Significant decrease in RR (p< 0.005) and MAP (p< 0.002) in music group</p> <p>-Significant improvements in pain (p< 0.001) and anxiety (p< 0.004) over time in music group</p> <p>-Significantly lower s-cortisol levels in music group immediately after intervention (p< 0.02)</p> <p>-No significant differences in MAP, HR, RR, PaO₂, SaO₂, pain, and anxiety between groups</p>
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				Setting: -POD 1 -Hospital in Sweden	-Mann-Whitney U test for s-cortisol, pain, and anxiety -Changes analyzed with RENOVA and Wilcoxon's signed rank test for s-cortisol, pain, and anxiety over time	
Nilsson, U. (2009b). Soothing music can increase oxytocin levels during bed rest after open-heart surgery: a randomized control trial. <i>Journal of Clinical Nursing</i> , 18(15), 2153-2161. doi:10.1111/j.1365-2702.2008.02718.x	To determine the effect music has on oxytocin levels in open-heart surgery patients on postoperative day one.	None noted	Randomized controlled trial Power=80%	Sample: N=40 Male: n=32 Female: n=8 Intervention group N=20 Bedrest (control) group N=20 Exclusion: emergent surgery, surgery after 12pm, previous cardiac surgery, corticosteroid use, balloon pump/pacemaker	Measures: -serum oxytocin levels -mean arterial pressure (MAP) -heart rate (HR) -PaO ₂ -SaO ₂ -relaxation scores Instruments: -Enzyme immunoassay -Vitals monitors -Numeric rating scale for relaxation Data Analysis: -descriptive statistics -student t-test and kruskal Wallis tests for differences between groups	-Mean age music group: 64; control group: 67 -Longer surgery time in intervention group (241 vs. 190 minutes) -Lower pre values of oxytocin in intervention group -Significant increase in oxytocin levels in intervention group at consecutive time intervals between groups, but not over time within groups -Significant difference over time in MAP for intervention group (p< 0.002)

				<p>r, still intubated, hearing impairment, or participation in other studies</p> <p>Intervention: -music mp3 pillow -30 minutes -volume 50-60dB -60-80 bpm -MusiCure® music</p> <p>Setting: -Not addressed</p> <p>-Day 1 after surgery (likely ICU)</p>	<p>-Bonferroni correction for changes in measures over time -Wilcoxon's signed rank test and Bonferroni correction for changes in relaxation scores between groups and over time. -Mann-Whitney test for differences in changes in oxytocin and relaxation scores between times</p>	<p>-Significant increase in PaO2 levels for intervention group</p> <p>-Significant improvement in relaxation scores over time (p< 0.001; p= 0.003)</p>
<p>Özer, N., Özlü, Z.K., Arslan, S., & Günes, N. (2013). Effect of music on postoperative pain and physiologic</p>	<p>To determine if personal music choice has an effect on self-reported pain and</p>	<p>Cognitive-behavioral</p>	<p>Two-group pretest posttest; quasiexperimental</p> <p>No blinding</p>	<p>Sample: Convenience sample</p> <p>N= 87 equally distributed</p> <p>Male: n=62 Female: n=25</p>	<p>Measures:</p> <ul style="list-style-type: none"> - SBP, DBP, HR, SpO2, RR - Pain intensity <p>Instruments:</p> <ul style="list-style-type: none"> - Unidimensional verbal pain intensity scale 	<p>-Mean age music group= 57.34; control group= 51.25</p> <p>-Significant difference in pain intensity after music intervention compared to control group (P= .000) and no pretest difference</p>

<p>parameters of patients after open heart surgery. <i>Pain Management Nursing</i>, 14(1), 20-28.</p>	<p>other physiologic parameters</p>			<p>CABG and valve surgery patients</p> <p>Standard post-surgical interventions and analgesia were consistent</p> <p>Exclusion: emergent surgery, chronic pain, hearing impairment, cognitive impairment, hemodynamic instability, <18 years old, unable to speak Turkish, not POD 1</p> <p>Intervention: -Afternoon -Choice of 20 musical pieces -Listened for 30 minutes</p>	<ul style="list-style-type: none"> - Vital sign equipment <p>Data Analysis:</p> <ul style="list-style-type: none"> - SPSS - Non-parametric and chi-square for demographics - Parametric for vitals and pain - Independent-samples t test between groups - Paired t test for pretest and posttest physiologic parameters 	<p>-No significant difference in posttest means for SBP, DBP, HR, SpO2, or RR</p> <p>-Statistically significant increase in SpO2 after music within the group (p=.000)</p>
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				<p>-50-60dB -Earphones</p> <p>Setting: -Turkish hospital</p> <p>-Intensive care unit (ICU)</p>		
<p>Stein, T.R., Olivo, E.L., Grand, S.H., Namerow, P.B., Costa, J., & Oz, M.C. (2010). A pilot study to assess the effects of a guided imagery audiotape intervention on psychological outcomes in patients undergoing</p>	<p>To determine effectiveness of a guided imagery intervention versus music for CABG patients for reducing anxiety and depression</p>	<p>None noted</p>	<p>Randomized controlled trial</p>	<p>Sample: -N= 43</p> <p>Control N= 18</p> <p>Male: n=39 Female: n=17</p> <p>Guided imagery N= 14</p> <p>Music-only N= 11</p> <p>Intervention: -Listened preoperatively and intraoperatively,</p>	<p>Measures:</p> <ul style="list-style-type: none"> - Anxiety - Depression <p>Instruments:</p> <ul style="list-style-type: none"> -Hospital Anxiety and Depression Scale (HADS) -Profile of Mood States (POMS) -“Successful Surgery” guided imagery tape with and without voiceover <p>Data Analysis:</p>	<p>-Majority were male and white</p> <p>-Mean age: imagery group= 68.7; music group= 64.3; control= 65.4</p> <p>-More women in intervention group</p> <p>-No significant differences in postop scores in HADS or POMS for any group</p> <p>-Baseline mood predicted postop mood scores</p> <p>Limitations:</p>

<p>coronary artery bypass graft surgery. <i>Holistic Nursing Practice</i>, 24(4), 213-222.</p>				<p>then were evaluated at 1 week postop and 6 months postop -“Successful surgery” tape; 1 with voiceover guidance and 1 with only the background relaxation music -Allowed patients to listen as much or as little as they preferred</p> <p>Setting: -Columbia University Medical Center</p>	<p>-Patient diaries -SPSS -Chi-square and ANOVA for between group differences -Multiple regression analyses for predictors of postop psychologic functioning</p>	<p>-No moderate or severely depressed patients were in guided imagery group</p>
<p>Vaajoki, A., Pietilä, A., Kankkunen, P., & Vehviläinen-Julkunen. (2012). Effects of</p>	<p>To determine effect of music listening on pain intensity and pain</p>	<p>None noted</p>	<p>Prospective study with parallel groups (alternating week enrollment)</p>	<p>Sample: N= 168 Male: n=90 Female: n=78 Underwent major upper</p>	<p>Measures: - Pain intensity and distress during rest, deep breathing, and changes in position</p>	<p>-Mean age: intervention group= 60; control group= 63 -Significant differences in fear about postoperative pain prior to procedure</p>

<p>listening to music on pain intensity and pain distress after surgery: an intervention. <i>Journal of Clinical Nursing, 21(5-6), 708-717.</i>doi: 10.1111/j.1365-2702.2011.03829.x</p>	<p>distress on POD 1-2 for abdominal surgery patients and day 3 for lasting effects</p>			<p>abdominal surgery</p> <p>Length of stay > 4 days</p> <p>Exclusion: drug abuse, psychiatric disorders, hearing impairment, dementia, chronic pain</p> <p>Intervention:</p> <ul style="list-style-type: none"> -30 minute periods -mp3 players and headphones -2000 song collection for patients to choose -No adherence to tempo or quality <p>Setting:</p>	<p>Instruments:</p> <ul style="list-style-type: none"> -Visual analog scale for pain <p>Data Analysis:</p> <ul style="list-style-type: none"> -SPSS -Descriptive statistics -Chi-square test for associations in demographics -Kolmogorov-Smirnov test for continuous data -ANOVA for repeated measures in pain between groups -Mann-Whitney U-test for long-term effects 	<p>-Significant decrease in pain during bed rest (p= 0.02), deep breathing (p= 0.03), and shifting position (p= 0.02) in music group</p> <p>-No differences between groups for long-term effects</p>
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				-Kuopio University Hospital in Finland		
Weeks, B.P., & Nilsson, U. (2011). Music interventions in patients during coronary angiographic procedures: A randomized controlled study of the effect on patients' anxiety and well-being. <i>European Journal of Cardiovascular Nursing</i> , 10(2), 88-93. doi: 10.1016/j.ejcnurse.2010.07.002.	Determine the effect of three types of sound on anxiety and well-being during coronary angiography	Kolcaba's Theory of Comfort	Prospective, randomized controlled trial without blinding	<p>Sample:</p> <ul style="list-style-type: none"> -Convenience sample -N= 102 -Control group: standard care Exclusion: <18 years old, unable to speak/understand English, hearing loss, psychiatric illness, severe dementia <p>Intervention:</p> <ul style="list-style-type: none"> -Loudspeaker music group -Patient-focused group using music pillow 	<p>Measures:</p> <ul style="list-style-type: none"> - Anxiety <p>Instruments:</p> <ul style="list-style-type: none"> -Numeric rating scale for anxiety -Questionnaire for well-being and sound environment specific to study <p>Data Analysis:</p> <ul style="list-style-type: none"> -SPSS -Kruskal-Wallis one-way analysis and Mann-Whitney test to compare between three groups -ANOVA; Friedman test for pair wise comparison 	<ul style="list-style-type: none"> -Loud speaker music stopped by request of patient, technician, and physician in four cases -Significantly higher anxiety in control group versus either music group (p< 0.05) -No difference between the two music groups -Patient focused music group had a more positive opinion of the sound environment

				<ul style="list-style-type: none">-MusiCure® genreless sound-60-80 bpm-volume set to preference in each group <p>Setting:</p> <ul style="list-style-type: none">-US community hospital with a cath lab program -In the cath lab during procedure		
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APPENDIX B

NURSING MUSIC INTERVENTION INFORMATION SHEET

APPENDIX B

NURSING MUSIC INTERVENTION INFORMATION SHEET

CV Surgery Music Intervention Information SheetBenefits:

- Provides a complementary therapeutic adjunct to pharmaceutical methods in relieving pain and anxiety postoperatively in open heart patients
- Improves the immediate physical environment
- Safe

Patients MUST meet these criteria to participate:

- S/P cardiac surgery (CABG, AVR, MVR, etc.)
- Alert and oriented x3
- Hemodynamically stable (No clinical deterioration; SBP > 90mm Hg and asymptomatic)
- No psychiatric history/issues
- Is able to put on and take off headphones without assistance
- Patient must be in room during use; NOT off the unit or in a procedure or test

Directions:

- When CV surgery patient arrives from ICU, tape a **flyer** either to the bedside table or near the whiteboard. Inform them that mp3 players are available for their use and give them a **disclaimer form**.
- Nurses may **recommend** the music intervention if they feel it may be beneficial to the patient.
- Nurses may **delegate** a CNA to deliver the intervention and collect the mp3 players.
- Mp3 players must be **checked out** via the log at the charge nurse desk.
- Mp3 players are NOT FOR THE PATIENT. Patients may keep the headphones only.
- Please **wipe mp3 player down** with the appropriate cleansing agent before returning once the patient is finished with the equipment (orange for *C.diff* precautions; purple for all other)

DAY OF DISCHARGE:

- Give a survey** to your CV surgical patient just prior to discharge and ask them to complete it.

- Nurse, nursing assistant, or family member **may help a patient** fill it out if they cannot read the form.
- Place completed survey in the **designated folder** at the charge nurse desk

APPENDIX C
PATIENT INFORMATION FLYER

APPENDIX C

PATIENT INFORMATION FLYER

Welcome to C4 Telemetry!

MP3 players with preloaded music are available for personal use to facilitate comfort in your postoperative recovery. Ask your nurse if interested.

Genres available:

- Jazz
 - Country
 - New Age/ Ambient
 - Native American
 - Spanish/ Latin
 - East Indian
 - East Asian

****When done with use, please return MP3 player to your nurse.***

APPENDIX D

ACTUAL BUDGET BREAKDOWN FOR BEDSIDE MUSIC INTERVENTION

APPENDIX D

ACTUAL BUDGET BREAKDOWN FOR BEDSIDE MUSIC INTERVENTION

Item	Quantity	Total Cost		
Mp3 Players	5	\$79.40	(Source: amazon.com)	
Paper folder	1	\$0.79	(Source: amazon.com)	
Color copy paper (reams)	2	\$10.00	(Source: amazon.com)	
Music tracks	56	\$46.85	(Source: amazon.com)	
	Subtotal	\$137.04		

APPENDIX E
NURSING MUSIC INTERVENTION LOG

APPENDIX F
WEEKLY NURSING FEEDBACK LOG

APPENDIX G

MP3 PLAYER CHECKOUT LOG

APPENDIX H

PATIENT DISCHARGE SURVEY/QUESTIONNAIRE

APPENDIX H

PATIENT DISCHARGE SURVEY/ QUESTIONNAIRE

Survey to Evaluate Pain, Anxiety, and Satisfaction after Music Listening

Age: _____

Gender: M F TG

Type of heart surgery: Bypass / Aortic Valve / Mitral Valve / Aortic aneurysm repair

Were you *offered* music to listen to during your hospital stay? Yes / No

How did you find out about the music service?

Staff nurse Doctor Family Flyer Other: _____

Did you listen to music during your hospital stay? Yes / No

(If you answered no, answer the next question then stop. If you answered yes, please continue below.)

Reason for not listening to music:

Unaware of service Didn't think it is useful Don't like music Other: _____

Please choose the option that best fits your perceptions after your heart surgery.

1= Strongly Disagree; 2= Disagree; 3= Neutral; 4= Agree; 5= Strongly Agree

I experienced pain *after* my heart surgery.

1 2 3 4 5

I experienced anxiety *after* my heart surgery.

1 2 3 4 5

I was satisfied with the music choices.

1 2 3 4 5

Operating the mp3 player was easy.

1 2 3 4 5

Listening to music improved my overall hospital experience.

1 2 3 4 5

What were your reasons for using therapeutic music during your hospital stay? (select all that apply)

- Distraction
- To relieve pain
- To reduce anxiety
- To pass time
- To relieve nausea

APPENDIX I
PATIENT DISCLOSURE FORM

APPENDIX I

PATIENT DISCLOSURE FORM

**Music as a Therapeutic Nursing Intervention and Cardiac Surgical Inpatients' Experience:
A Quality Improvement Project****Principal Investigator: Ashley Dacey, BSN, RN, DNP-AGACNP Student**

The purpose of this quality improvement project is to create and implement a new bedside music nursing intervention and to evaluate trends in music utilization as well as explore cardiac surgical inpatients' experiences in the context of the intervention.

Participation is voluntary. To participate, you can request the music players from your nurse. There is no minimum or maximum timeframe for listening to the music. You may not use the music during treatment procedures, consultations, surgery, or at any time you are off the unit.

If you choose to take part in this project, you will be asked to provide feedback regarding your hospital experience on a survey just prior to discharge. It will take approximately five to ten minutes to complete this survey. There are no foreseeable risks associated with participating in this research. A benefit of this project may be reduced pain and anxiety. The feedback reported on the survey will be used to determine if music is beneficial or impractical in improving the patients' hospital experience. Survey responses are anonymous.

If you choose to participate in the project, you may discontinue participation at any time without penalty. In addition, you may skip any question that you choose not to answer. By participating, you do not give up any personal legal rights you may have as a participant in this project. You will continue to receive standard postoperative care and are in no way exempt from receiving standard treatment. An Institutional Review Board responsible for human subjects' research at The University of Arizona reviewed this project and found it to be acceptable, according to applicable state and federal regulations and University policies designed to protect the rights and welfare of participants in research. For questions about your rights as a participant in this project or to discuss other concerns or complaints with someone who is not part of the research project team, you may contact the Human Subjects Protection Program at 520-626-6721 or online at <http://rgw.arizona.edu/compliance/human-subjects-protection-program>.

For questions, concerns, or complaints about the project, you may contact Ashley Dacey, BSN, RN, DNP-AGACNP Student at 480-628-1536 or via email at adacey@email.arizona.edu.

By taking this survey you agree to have your responses used for research purposes.

APPENDIX J
NURSE DISCLOSURE FORM

APPENDIX J

NURSE DISCLOSURE FORM

**Music as a Therapeutic Nursing Intervention and Cardiac Surgical Inpatients' Experience:
A Quality Improvement Project****Principal Investigator: Ashley Dacey, BSN, RN, DNP-AGACNP Student**

The purpose of this quality improvement project is to create and implement a new bedside music nursing intervention and to evaluate trends in music utilization as well as explore cardiac surgical inpatients' experiences in the context of the intervention.

Participation is voluntary. If you choose to participate, you must first review the information sheet provided via email, then, post patient information flyers in patient rooms, and suggest the intervention to patients. You will be responsible for checking out and returning the mp3 players using a log sheet by the charge nurse. Once a week, log your participation using the activity log. At any point during the intervention period, please offer a response on the feedback log located around the nursing station and in the breakroom. Nurses must give a discharge survey/questionnaire to every cardiac surgical patient and ask them to complete it immediately prior to their discharge.

There are no foreseeable risks associated with participating in this research. A benefit of this project may be an improved patient experience and a feasible adjunct to the standards of care of cardiac surgical patients. Feedback provided by the nursing staff will be used to determine if the intervention was feasible in daily practice, whether level and years of experience influences intervention utilization, and how to continually improve the intervention for sustainable use. All responses and documentation will remain anonymous.

If you choose to participate in the project, you may discontinue participation at any time without penalty. In addition, you may skip any question that you choose not to answer. By participating, you do not give up any personal legal rights you may have as a participant in this project. This project does not intend to replace or change job descriptions or hospital policy. An Institutional Review Board responsible for human subjects' research at The University of Arizona reviewed this project and found it to be acceptable, according to applicable state and federal regulations and University policies designed to protect the rights and welfare of participants in research. For questions about your rights as a participant in this project or to discuss other concerns or complaints with someone who is not part of the research project team, you may contact the

Human Subjects Protection Program at 520-626-6721 or online at <http://rgw.arizona.edu/compliance/human-subjects-protection-program>.

For questions, concerns, or complaints about the project, you may contact Ashley Dacey, BSN, RN, DNP-AGACNP Student at 480-628-1536 or via email at adacey@email.arizona.edu.

By taking this survey you agree to have your responses used for research purposes.

APPENDIX K

DIGNITY HEALTH IRB APPROVAL LETTER

APPENDIX K

DIGNITY HEALTH IRB APPROVAL LETTER



Federal Wide Assurance (FWA)
 #00001499 Dignity Health
 IORG0001540

IRB: East Valley Regional IRB FWA#:00001499; IRB#:00001993
DATE: March 20, 2017
TO: Katherine Kenny, DNP
RE: Music as a Therapeutic Nursing Intervention

IRB# **EVR-17-113**

IRB Submission: Initial Review Submission Form Ref#
016115 IRB Review Type: Expedite
IRB Decision: Approved

Approval Date: 03/20/2017
Approval Expiration Date: 03/19/2018
Review Cycle: 12 Month Review Cycle

The Institutional Review Board (IRB) has reviewed and approved your new protocol submission including the following documents listed in Appendix 1:

As principal investigator for the above referenced study, you are responsible for the following:

- Adherence to applicable Federal regulations, Dignity Health policy and the policies of this Institutional Review Board.
- Supervision and responsibility for all investigators and research team members engaged in research covered by this IRB.
- Responsible for using the current IRB approved consent form (if applicable).
- Record keeping of all activities including documentation of information consent when applicable.
- Promptly reporting all internal adverse events according to Dignity Health and IRB guidelines.
- Promptly reporting external adverse events according to Dignity Health and IRB guidelines.
- Promptly reporting any deviations from the protocol or consent process (including 'emergency' enrollment).

- Promptly reporting any new unanticipated risks or new information that may impact the protocol, study subjects or others.

- Promptly reporting all study management correspondence with regulatory agencies and sponsors including administrative actions.
- Promptly reporting DSMB reports when received and/or available.
- Submission of a periodic progress/renewal report no less than annually to the IRB. The IRB has designated that it will review this protocol every 12 Month Review Cycle. Progress Reports must be received and approved prior to expiration date to allow continuing enrollment and/or data collection.
- Reporting of any changes to this study including; protocol, consent, application, investigators, and study staff **prior** to implementation. (Changes necessary to eliminate immediate hazards to subjects may be implemented prior to IRB approval.)
- Submission of a study closure report within 30 days of the study's completion.

The IRB and Dignity Health maintains the authority to terminate or suspend approval of research that is not being conducted in accordance with the requirements stated above and/or research that has been associated with unexpected serious harm to subjects.

Title: Music
Intervention Reference
016115
Page 2 of 2

If you have any questions or need further assistance please contact the East Valley Regional IRB Office at (480) 728-3582 or by email to julie.lynk@dignityhealth.org

Sincerely,

Brian R Tiffany, MD, PhD

(This has been electronically signed)

Appendix 1

Reference #: **016115**

<i>Submission Components</i>			
<i>Form Name</i>	<i>Version</i>	<i>Outcome</i>	
<i>Initial Review Submission Form</i>	<i>Version 1.0</i>	<i>Approved</i>	
<i>Dignity Health Internal IRB Application</i>	<i>Version 1.0</i>	<i>Approved</i>	
<i>Study Document</i>			
<i>Title</i>	<i>Version #</i>	<i>Version Date</i>	<i>Outcome</i>
<i>Dacey_A COI 2016</i>	<i>Version 1.0</i>	<i>03/20/2017</i>	<i>Acknowledged</i>
<i>COI_Kenny K Music Intervention</i>	<i>Version 1.0</i>	<i>03/14/2017</i>	<i>Acknowledged</i>
<i>AE Form - signed</i>	<i>Version 1.0</i>	<i>03/14/2017</i>	
<i>Nurse Feedback Log</i>	<i>Version 1.0</i>	<i>03/14/2017</i>	<i>Approved</i>
<i>CV Music Activity Log</i>	<i>Version 1.0</i>	<i>03/14/2017</i>	<i>Approved</i>
<i>Patient Survey</i>	<i>Version 1.0</i>	<i>03/14/2017</i>	<i>Approved</i>
<i>MP3 Player Checkout</i>	<i>Version 1.0</i>	<i>03/14/2017</i>	<i>Approved</i>
<i>Nurse Information</i>	<i>Version 1.0</i>	<i>03/14/2017</i>	<i>Approved</i>
<i>Patient - Invitation to participate</i>	<i>Version 1.0</i>	<i>03/14/2017</i>	<i>Approved</i>

APPENDIX L

UNIVERSITY OF ARIZONA IRB APPROVAL LETTER

APPENDIX L

UNIVERSITY OF ARIZONA IRB APPROVAL LETTER



Human Subjects Protection Program

1618 E. Helen St. P.O.Box 245137
 Tucson, AZ 85724-5137
 Tel: (520) 626-6721
<http://rgw.arizona.edu/compliance/home>

Date: April 26, 2017
Principal Investigator: Ashley Dacey
Protocol Number: 1704377122
Protocol Title: MUSIC AS A THERAPEUTIC NURSING INTERVENTION AND
 CARDIAC SURGICAL INPATIENTS' EXPERIENCE: A QUALITY
 IMPROVEMENT PROJECT
Level of Review: Administrative Review
Determination: Approved
IRB of Record: Dignity Health East Valley Regional IRB

Documents Reviewed Concurrently:

Data Collection Tools: *NURSING MUSIC INTERVENTION LOG.docx*
Data Collection Tools: *SURVEY QUESTIONNAIRE.DOCX*
Data Collection Tools: *Weekly Nurse Feedback Log.docx*
HSPF Forms/Correspondence: *F107 Verification of Training Form for UA.doc*
HSPF Forms/Correspondence: *f204_v2016-07_06Apr17_RTP 26Apr2017.doc*
HSPF Forms/Correspondence: *Signature page.pdf*
Informed Consent/PHI Forms: *Nurse disclosure statement.docx*
Informed Consent/PHI Forms: *Patient Disclosure Statement.Submitted and Accepted.IRB.pdf*
Other Approvals and Authorizations: *Chandler IRB Approval.pdf*
Participant Material: *CV Surgery MP3 Player Checkout Log.docx*
Participant Material: *Music information sheet for nursing.docx*
Recruitment Material: *Musicflyer (1).docx*

Regulatory Documentation: *AE Form_Ashley Dacey _signed 022717.pdf*

Institution Designated the IRB of Record: When an institution is the designated IRB of record, the UA IRB will not review the project. The University of Arizona agrees that it will rely on the review, approval, and continuing oversight by the institution IRB of those protocols approved by the institution pursuant to the terms of the Institutional Review Board Authorization Agreement (if applicable) and as outlined in the HSPP files.

- The University of Arizona maintains a Federalwide Assurance with the Office for Human Research Protections (FWA #00004218).
- All documents referenced in this submission have been reviewed and are filed with the HSPP.
- The Principal Investigator should notify the IRB immediately:
 - Any proposed changes that affect the LOCAL protocol.
 - Reports any LOCAL unanticipated problems involving risks to participants or others.
 - Continuing Review by the IRB of record has been completed.
 - When the study is complete at the LOCAL site.
- Please refer to the Guidance Ceded IRB Review for more information on local PI responsibilities. All research procedures should be conducted according to the approved protocol and the policies and guidance of the IRB of record.

This project has been reviewed and approved by an IRB Chair or designee.

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