

MUSIC INTERVENTION FOR THE BURN POPULATION

by

Erika Rivas

Copyright © Erika Rivas 2019

A DNP Project Submitted to the Faculty of the

COLLEGE OF NURSING

In Partial Fulfillment of the Requirements

For the Degree of

DOCTOR OF NURSING PRACTICE

In the Graduate College

THE UNIVERSITY OF ARIZONA

2019

THE UNIVERSITY OF ARIZONA
GRADUATE COLLEGE

As members of the DNP Project Committee, we certify that we have read the DNP project prepared by Erika Rivas, titled Music Intervention for the Burn Population and recommend that it be accepted as fulfilling the DNP project requirement for the Degree of Doctor of Nursing Practice.

Christy L Pacheco

Date: Dec 4, 2019

Christy L. Pacheco, DNP, FNP-BC

Sara J. Edmund

Date: Dec 5, 2019

Sara J. Edmund, DNP, RN, FNP-C, PMHNP-BC

Heather L. Carlisle

Date: Dec 5, 2019

Heather L. Carlisle, PhD, DNP, RN, FNP, AGACNP, CHPN

Final approval and acceptance of this DNP project is contingent upon the candidate's submission of the final copies of the DNP project to the Graduate College.

I hereby certify that I have read this DNP project prepared under my direction and recommend that it be accepted as fulfilling the DNP project requirement.

Christy L Pacheco

Date: Dec 4, 2019

Christy L. Pacheco, DNP, FNP-BC
DNP Project Committee Chair
College of Nursing

ARIZONA



ACKNOWLEDGMENTS

There are several people who played an important role with the completion of this DNP project. First and foremost, I would like to thank my wonderful kiddos Ben and Elise for all the sacrifices you two have made throughout this program. My boyfriend Russell for his words of encouragement and acts of kindness, I appreciate you more than you'd ever know and my parents who have always supported me in any endeavor that I embark on. You all mean the world to me.

To my chair, Dr. Christy Pacheco words can't describe how thankful I am for your guidance and support during this never ending process.

To my committee members Dr. Sara Edmund and Dr. Heather Carlisle thank you for the hours you spend reviewing my work and providing feedback.

Finally I would like to offer my gratitude to the Arizona Burn Center especially Dr. Foster who gave me the opportunity to carry out this project.

DEDICATION

I would like to dedicate this work to my wonderful children Benjamin and Elise. Dr.
Mommy loves both of you to the core of my existence.

TABLE OF CONTENTS

LIST OF FIGURES	8
LIST OF TABLES	9
ABSTRACT	10
INTRODUCTION	12
Background	14
What is a Burn?	15
Burn Depth	16
Burn Size	17
Transfer to a Burn Center	18
Management of a Burn Injury	20
Burn Pain	21
Psychological Ramifications of Burn Injuries	22
Music Intervention	24
Local Problem	25
Purpose	27
Study Questions	28
Literature Review	28
Search Method	28
Psychological Outcomes	29
Psychometric Scales for ASD and PTSD	31
Scales for Pain and Anxiety	32
Supporting Literature for Music Interventions	33
Gaps in Literature	36
Theoretical Framework	36
Conceptual Model	38
The Five Phases	39
Concepts	41

TABLE OF CONTENTS – *Continued*

METHODS	42
Design	42
Setting	42
Sample	43
Recruitment	43
Intervention	45
Data Collection	46
Patient Anxiety Assessment Tool	46
Patient Baseline Data	46
Nurse Satisfaction Tool	47
Data Collection Methods	47
Data Analysis	49
Ethical Considerations	49
RESULTS	50
Introduction	50
Demographic Data	50
Music Intervention	53
Nursing Survey Responses	57
DISCUSSION	61
Introduction	61
Study Question 1	61
Study Question 2	63
Study Question 3	64
Project Limitations	64
Recommendations for Future Practice	67
Dissemination	69
Conclusion	69

TABLE OF CONTENTS – *Continued*

OTHER INFORMATION	69
Projected Costs	69
APPENDIX A: THE UNIVERSITY OF ARIZONA INSTITUTIONAL REVIEW BOARD APPROVAL LETTER.....	71
APPENDIX B: RECRUITMENT FLYER	73
APPENDIX C: BASELINE PATIENT CLINICAL DATA.....	75
APPENDIX D: PATIENT SURVEY.....	77
APPENDIX E: BURN SPECIFIC PAIN ANXIETY SCALE.....	79
APPENDIX F: NURSES SURVEY	81
APPENDIX G: PATIENT DISCLOSURE FORM.....	83
APPENDIX H: NURSES DISCLOSURE FORM	86
APPENDIX I: LITERATURE REVIEW OF PSYCHOLOGICAL OUTCOMES	89
APPENDIX J: LITERATURE REVIEW OF MUSIC INTERVENTIONS.....	99
REFERENCES	105

LIST OF FIGURES

<i>FIGURE 1.</i>	Music intervention timeline.	47
<i>FIGURE 2.</i>	Scores of burn participant's pre- and post-BSPAS.	57
<i>FIGURE 3.</i>	The nurses' perception of music's effectiveness on anxiety.	58
<i>FIGURE 4.</i>	Nurses' knowledge regarding evidence-supporting music for anxiety management.	59
<i>FIGURE 5.</i>	Nurses' utilization of music interventions.	60
<i>FIGURE 6.</i>	Music interventions feasibility into daily practice.	61

LIST OF TABLES

TABLE 1.	<i>Patient demographic and clinical data</i>	52
TABLE 2.	<i>Paired samples statistics (correlations and t-test)</i>	53

ABSTRACT

Background: Burn injuries are one of the leading causes of unintentional deaths in the United States (Capek et al., 2018). Patients who sustain a burn injury endure many painful procedures throughout their road to recovery. The repetition of these painful procedures often creates anticipated anxiety, which can have a significant impact in the recovery of burn patients. Studies have demonstrated the positive effects of music interventions in decreasing anxiety in burn patients. Given the high prevalence of psychiatric disorders associated with burn injuries, it is imperative to provide early interventions that are aimed to minimize psychological distress and promote comfort within the burn population.

Aims: This quality improvement project evaluated the effectiveness of music on anticipatory anxiety among burn patients while also providing the nursing staff with information on the benefits of music intervention in procedural anxiety and pain.

Methods: Patients anticipated anxiety levels were measured before their dressing change using a one-group, pre and posttest design. A Likert scale survey was used to determine the nurses' perception and knowledge of music intervention as well as their daily utilization in practice.

Results: A total of N=7 burn patients met the inclusion criteria and participated in the music intervention portion of this quality improvement project. Findings indicated that this design was underpowered to detect statistically significant improvement $t(6) = 1.629$, $p = 0.155$, $d = 0.61$, 95% C.I. [-3.68, 15.01]. A total of N=21 nurses completed the nursing portion. Findings indicated that 62% (n=13) perceived music as effective in reducing anxiety during painful procedures while only 24% (n=5) were aware of the evidence supporting its use for anxiety management in burn patients. Music therapy was reported as “always” utilized by 29% (n=6) of the nurses during

dressing changes and 90% (n=19) of the nurses felt that music could be easily incorporated into daily use if supplies were available.

Conclusion: This quality improvement project demonstrated that although nurses lacked knowledge of music intervention and its evidence supporting its use on burn patients, their perception of its effects on anxiety was positive and supported by their frequent utilization of music. Music intervention was found to be effective in decreasing anxiety scores in four out of seven participants. Clinical observation demonstrated that music interventions supported the basic principle of Kolcaba's theory of comfort by promoting a state of ease and contentment in burn patients (Kolcaba, 2003). These findings suggest that music intervention is a safe, nonpharmacological, evidence-based intervention that can be easily utilized to enhance the care of burn patients.

INTRODUCTION

Burns are some of the most challenging injuries to manage because they frequently require lengthy hospitalizations, multiple surgeries, and extensive rehabilitation. Patients who sustain a burn injury endure many painful procedures throughout their road to recovery. Procedures such as changes in dressings, skin grafting, and debridement are necessary to promote healing but are painful and can cause the patient considerable distress. Pain is often undertreated and a major issue when caring for a patient with a burn injury. Opioids are the primary pharmacological treatment for pain management. Still, these medications may not be utterly effective as the systemic changes seen with large burns can alter pharmacokinetics and pharmacodynamics effects over time, leading to frequent adjustment and poorly controlled pain (Meyer III, Martyn, Wiechman, Thomas, & Woodson, 2018). Inadequate pain management can also interfere with a patients' sleep, exacerbate burn hypermetabolism, limit their participation in rehabilitation, and increase the risk of developing long-term psychological complications (Judkins & Clark, 2010).

Inadequate pain management can also lead to the development of anticipatory anxiety. Anticipatory anxiety is anxiety that occurs merely due to the anticipation of a painful procedure. Evidence has shown that when a burn patient undergoes a painful procedure, this anticipatory anxiety further exacerbates their pain (Carrougher et al., 2006; Ferguson & Voll, 2004). This anxiety can have negative effects on the psychological and physiological status of the patient. Posttraumatic stress disorder (PTSD) is the most commonly seen psychological complication within burn survivors. Longitudinal studies on burn survivors have indicated that PTSD has a 1-year prevalence rate ranging between 19 % and 45% (Van Loey, Maas, Faber, & Taal, 2003).

Furthermore, inadequate pain management also puts a strain on the therapeutic relationship between the patient and the nurse. Burn nurses are continually exposed to patients who suffer for extended periods (Nagy, 1998). The therapeutic relationship between nurses and patients is based on trust and the ability to provide comfortable care. When a nurse is put in situations where they cannot provide sufficient pain relief, the therapeutic relationship suffers. Nurses would benefit from having additional resources available to help them facilitate comfort.

Implementation of non-pharmacological methods, in combination with pharmacological interventions, should be sought out and further evaluated within the burn population. There is significant evidence in the use of nonpharmacological therapies and their role in addressing psychological and physiological factors that can exacerbate pain (Patterson, Hoffman, Weichman, Jensen, & Sharar, 2004). The therapeutic effects of music therapy as an alternative to or in conjunction with pharmacological interventions have been studied in various clinical settings and shown to decrease the psychobiological stress response (Hsu, Chen, & Hsieh, 2016; Nilsson, Unosson, & Rawal, 2005; Suda, Morimoto, Obata, Koizumi, & Maki, 2008). Music therapy offers an important adjuvant treatment during dressing changes for burn patients. This project examines the effectiveness and satisfaction of implementing a music intervention during dressing changes on a burn unit in a southwestern regional burn center. Providing additional interventions to manage pain and anxiety is necessary and can help minimize the development of long-term psychological disorders.

Background

In 2017, The National Center for Injury Prevention and Control (NCIPC) estimated that between 2011 and 2015, 486,000 people received emergency medical treatment for a burn injury, with more than 40,000 of these patients requiring hospitalization each year. While advances in medicine and standardized burn care protocols have contributed to a decrease in mortality rates, burn injuries are still one of the leading causes of unintentional deaths in the United States (Capek et al., 2018). According to the American Burn Association, in 2016, the percentage of burns routinely seen were caused by flash/flame (43%), scald (34%), contact (9%), electrical (4%), and chemical burns (3%). Most of these injuries occurred at work (76%), on the street/highway (8%), and in recreational areas (5%). Recently there has been a rise in fires associated with the use of e-cigarettes. A report by the US Fire Administration (2017) indicated that 195 cases of explosions related to e-cigarettes occurred between January 2009 and December 2016. Of these incidents, 38% were severe and required hospitalizations.

According to Moi, Haugsmyr, and Heisterkamp (2016), many patients who were treated for a burn injury will report persisting problems related to scarring, pain, sleep, body image, and their psychosocial well-being. A burn severity, the management of the pain, and the length of hospitalization can contribute to these persisting problems. Pain in a patient with a burn injury is complicated, as various factors will affect the manifestation of this pain. To further understand these factors, it is essential to discuss what a burn injury is and what a burn patient endures during their hospitalization.

What is a Burn?

A burn injury can occur under many different circumstances. Thermal burns are the most common and are a result of dry heat (e.g., flash/flame or by wet heat [scalds]). Flash burns are caused by brief, indirect exposure to intense flashes of UV light. Sources for this burn type include the UV light of welding torches and explosions of natural gas, propane, or other flammable items. Flash burns are typically not severe unless the flash ignites a victim's clothing or hair, resulting in a flame burn. Fire or flame burns occur when an individual is exposed to open fire. The severity of a flame or fire burn depends on the duration of the direct exposure the skin had to the flame. The injury can affect different layers of the skin, producing a deeper burn.

A scald is a burn that results from exposure to hot liquids or hot steam. These types of burns are commonly seen in children under the age of 5 and can be either accidental or intentional, for example, a child pulling a pot of boiling water from the stove or a purposeful immersion, a form of child abuse. The depth of the injury depends on the duration of the contact, the temperature, and the thickness of the victims' skin (Andrews, Kimble, Kempf, & Cuttle, 2017).

Contact burns are a result of prolonged contact with any hot surface. Contact with hot asphalt is a widespread injury seen in Arizona where the summer temperature can rise as high as 115 degrees. Contact burns can occur from walking barefoot on the scorching pavement or laying on the hot pavement after a fall. These burns may vary in depth depending on the duration of the contact, the temperature of the surface and the thickness of the victims' skin.

Chemical burns are caused by direct contact with either a strong acid or a strong base. These burns are often a result of industrial accidents, assaults, or improper use of harsh solvents

(Brownson & Gibran, 2017). Ingestions of corrosive solvents are another example of a chemical burn and commonly seen especially with young children. The degree of tissue damage from a chemical burn depends on the strength of the agent, the duration of the exposure, the chemistry of the chemical, and the mode of contact (ingestion vs. inhalation).

Electrical burns occur when the electric current comes in contact with the body. This type of burn is frequently seen in occupations where one may be working with high-voltage power lines or electrical installations. Small children are also at risk as they may stick metal objects into light sockets or bite on electrical cords. Although rare, lightning strikes are another cause of electrical burns. Electrical burns can pose many challenges as damage to the skin depends on the nature of the current, the voltage, the extent of contact with the skin, and the path of the current through the body (Friedstat, Brown, & Levi, 2017). Now that the different mechanisms of burn injuries have been described, it's important to understand how these injuries present on the skin.

Burn Depth

Determining the depth of a burn is a priority when assessing a burn injury. Burns may involve one or both layers of the skin. Burns may even extend into the subcutaneous fat, muscle, and boney structures. Burn depth is classified as first, second, third, or fourth degree. First-degree burns involve only the outer layers of the epidermis, do not form blisters and are very painful. The most common of these first-degree burns are sunburns or a brief flash burn. The estimated healing time for these burns is roughly 5-10 days and does not require surgical intervention.

Second-degree burns (partial thickness) involve the epidermis and the second layer of the skin called the dermis. These burns are referred to as partial thickness because they may

superficially reach the dermis layer or extend deeper into the reticular dermis (Brownson & Gibran, 2017). A superficial second-degree burn is pink and wet, often presents with blisters, is very painful, and blanches with pressure. These usually heal within two weeks with proper dressing changes. Deep second-degree burns appear mottled pink or white; the patient has little to no pain, and the burn may blanch, but the color returns slowly or not at all. These deep second-degree burns may or may not heal by three weeks. Burns that have not healed by three weeks will require surgical debridement and skin grafting. It is often difficult to distinguish between a superficial and a deep second-degree burn because the dermis on average is only about 2mm thick (Andrews, Kimble, Kempf, & Cuttle, 2017). Daily reassessment of burns is crucial because burn injuries become deeper in 3-4 days. It is not an uncommon practice to refer to these burns as an indeterminate-thickness wound.

Third-degree burns or full-thickness burns involve both layers of the skin plus extend into the superficial subcutaneous tissue (Brownson & Gibran, 2017). These burns may be white, brown, or leathery; there may be thrombosed vessels visible, they are painless, and at times the area will appear charred. Some full-thickness burns caused by scalds may appear red; however, these third-degree burns do not blanch with pressure and are painless. Full-thickness burns will not heal without surgical excision and grafting. There is also a high risk for contractions with these burn injuries. Fourth-degree burns involve damage to underlying tissues such as muscle, tendon, and bone. These burns often lead to amputation or significant impairment of function to the extremity affected (Parrett, Pomahac, Demling, & Orgill, 2006).

Burn Size

A final factor that affects a burn's severity is the extent to which the burn has affected the individual. The extent of a burn is otherwise known as the total body surface area (TBSA). In adults, the "rule of nines" can be used to determine the TBSA for each major section of the body, but this technique is not accurate in children. The most precise method for pediatrics is the Lund and Browder chart because it takes into consideration the age of the child to determine the ratio for each body area (Hettiaratchy & Papini, 2004). TBSA is also used to calculate an individual's early fluid resuscitation, which can prevent complications associated with burn shock. A TBSA of 10% or less is considered a minor burn in adults. A TBSA of 10-20% in adults is regarded as a moderate burn. A burn greater than 20% TBSA in adults is a severe burn. In children, these categories differ, and a minor burn is measured at less than 5% TBSA. Moderate burns cover roughly 5-10%, and a severe burn is anything more than 10%. According to Pham, Cancio and Gibran (2008) guidelines set by the American Burn Association indicate fluid resuscitation for adults with burns greater than 20% and children with burns greater than 10% TBSA.

Transfer to a Burn Center

When a patient suffers a burn, they are usually transported to an Emergency Department of a local hospital. The American Burn Association (2007) has developed burn center criteria to assist healthcare providers in identifying which patients should be transferred to a burn center. Burns should be treated in a specialized burn facility after initial assessment and treatment at an emergency department because it can significantly impact the patient's overall outcome. As of November 2018, there are 128 burn centers in the United States, but only 69 of them are verified burn centers. Treatment at a verified burn center is ideal because these centers have met the

American Burn Association rigorous verification process designed to assure that it meets the highest current standards of care for the burn-injured patient.

Management of a Burn Injury

The management of a burn injury is challenging. Burn injuries take a long time to heal, and depending on the factors discussed above, it is not uncommon for patients to remain hospitalized for weeks or even months. Burn injuries are also excruciating. Full-thickness burns may not be painful at first, but as granulation of the skin occurs, the nerve endings begin to grow, and these patients begin to experience severe pain. The primary goal for burn wound management is to close the wound as soon as possible (Benjamin & Jaco, 2018). However, not all burns require prompt surgical excisions of the eschar (dark patches of burned skin), and as explained above, some burns heal with just proper dressing changes. The second goal of wound care is to promote healing and maintain the function of the affected body part (Benjamin & Jaco, 2018). Burn wounds are a breeding ground for infections. Without the skins present, there is no barrier to protecting the patient from any organism. Infections are a primary factor contributing to 51% of deaths seen in burn patients (Rafla & Tredget, 2011). The importance of burn dressings should not be taken lightly as burn dressings serve to protect the wound from the outside environment, decrease pain, absorb drainage, and provide a moist environment to promote wound healing (Voigt, Cells, & Voigt, 2018).

Generally speaking, a burn dressing consists of removing the old dressings, cleaning the wound with soap and water, removing loose necrotic tissue also called debridement and applying new dressings. The duration of the procedure can last from several minutes to hours, depending on the size of the burn. The frequency of the burn dressing will differ depending on whether the wound has been grafted or not. Fresh burns that have not had any surgical intervention are commonly dressed twice a day. Burns that have undergone surgical excision and have a graft are

dressed daily. If a burn graft has become infected, the frequency of the dressing change may increase, and it is not rare to see it up to three times a day. Patients' donor sites (the area where the skin graft was obtained) also need to be kept clean and dry, but these dressings may remain on the skin for a more extended period. Studies have shown that pain management in burn patients is a difficult challenge and often undertreated due to the complexity of factors involved in the treatment of a burn injury (Browne, Andrews, Schug, & Wood, 2011; Meyer III et al., 2018; Summer, Puntillo, Miaskowski, Green, & Levine, 2007). Pain varies significantly between patients and throughout their healing process.

Burn Pain

There are three types of pain seen with burn patients: background pain, breakthrough pain, and procedural pain. Each of these types of pain requires a different treatment regimen. Background pain is experienced at rest and is described usually as dull and can be constant or intermediate. Background pain is generally managed by providing regularly scheduled medications with a long duration to promote steady drug concentrations in the body. Breakthrough pain is often felt as a result of a sudden movement (e.g., getting out of bed). This pain can be sharp and intense, usually relieved by providing an additional dose of a short-acting analgesic. Procedural pain is felt during procedures and has been described as severe burning accompanied by intermittent sharp pain. This type of pain requires boluses of intravenous analgesics. Procedural pain frequently induces significant anxiety and distress and is often undertreated (Nilsson, Kalman, Sonesson, Arvidsson, & Sjöberg, 2011).

Strong correlations have been found between pain and anxiety in various hospital settings. Anxiety plays a significant role more so in the burn center because repeated exposure to

painful procedures often creates anticipatory anxiety for patients with burns. Background pain plus the anticipation of procedural pain can increase a patient's perception of pain, which in turn can lead to greater anxiety (Meyer et al., 2018). This exacerbation of pain is also known as stress-induced hyperalgesia (Jennings, Okine, Roche, & Finn, 2014). The treatment of both pain and anxiety is crucial as patients who experience high levels of pain have a higher risk of poor adjustment and psychiatric problems after discharge (Askay & Patterson, 2008; Corry, Klick, & Fauerbach, 2010).

Psychological Ramifications of Burn Injuries

Although there is evidence supporting the prevalence of psychological distress during and after a burn injury, psychiatric morbidity is also common in individuals who sustain significant burns (McKibben et al., 2009; Palmu, Suominen, Vuola, & Isometsä, 2011). Studies by Fauerbach et al. (1997); Powers, Cruse, and Bowyd (2000), and Dyster-Aas, Willebrand, Wikehult, Gerdin, and Ekselius (2008) revealed that two-thirds of all patients with burns have a lifetime history of at least one psychiatric disorder. The most commonly seen disorders are depression, anxiety, and substance abuse disorders. Not only does the prevalence of psychiatric disorders create a complication for post burn injury adjustments, but these patients also have a higher incidence of complications and require a longer length of hospitalization (Mahendraraj, Durgan, & Chamberlain, 2016). Factors known to contribute to the development of inpatient psychiatric disorders include lack of sleep, and also high levels of stress, anxiety, and pain.

Acute stress disorder (ASD) and posttraumatic stress disorder (PTSD) are psychiatric disorders most commonly seen in burn patients. Classified by the *Diagnostic and Statistical Manual of Mental Disorders* (Fifth Ed) (DSM-5) under trauma and stress-related disorders, both

ASD and PTSD have similar symptomology. Still, ASD requires that the patient's symptoms last for \geq two days, but \leq four weeks. For a diagnosis of PTSD, the patient must have symptoms that persist for more than a month.

The prevalence of ASD in burn patients is as high as 19% (McKibben, Bresnick, Wiechman Askay, & Fauerbach, 2008). PTSD, however, is more common in burn survivors, with prevalence rates ranging between 7% and 45% (Low, Meyer, Willebrand, & Thomas, 2018). Depression is another psychiatric disorder observed, but its prevalence is low, ranging from 4% at discharge to 7% to 23% in patients 1-year post burn or greater (Thombs, Bresnick, & Magyar-Russell, 2006).

Assessing for the development of ASD is very important because ASD symptoms are the prominent predictor of the development of PTSD. An association also exists between PTSD and the anxious anticipation of pain. Studies have shown that when a patient undergoes a painful procedure, anticipatory anxiety further exacerbates their pain and provokes more anxiety and distress (Gillen, Biley, & Allen, 2008). The patients who experienced higher levels of pain-related anxiety during hospitalization reportedly had a significantly higher incidence of developing PTSD symptoms. Routinely, pain and anxiety are managed by the administration of pharmaceuticals but when the pain remains untreated, anticipatory anxiety may worsen, and the patient's psychological state will worsen. These patients began to lose sleep; they are fearful; they may refuse to comply with rehabilitation treatments, and ultimately, these psychological stressors interfere with their wound healing process.

In summary, burns are like no other injury in their complexity and treatment. Many patients feel helpless, fearful and often suffer from significant levels of anxiety. Given the high

prevalence of psychiatric disorders associated with burn injuries, it is imperative to provide early interventions that are aimed to minimize psychological distress and promote comfort within the burn population.

Music Intervention

There is a wide range of non-pharmacological therapies used to manage anxiety and alleviate pain. Nevertheless, some are not only time consuming but may require additional staff qualifications to implement the service safely. Music therapy is one of these modalities and is defined as: “The 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” (American Music Therapy Association, 2016, para.1). Evidence supports the effectiveness of music therapy as a form of complementary and alternative medicine (CAM) in managing anxiety and pain. Music has effectively been shown to decrease anxiety in patients requiring mechanical support (Chlan et al., 2013; Lee, Chung, Chan, & Chan, 2005), manage postoperative and procedural pain (Allred, Byers, & Sole, 2010; Voss et al., 2004) and reduce the pain experienced by burn patients during treatment procedures (Fratianne et al., 2001; Hsu et al., 2016).

Music is believed to have an impact on the body’s response to pain and anxiety because it distracts patients from the sense of painful stimuli and pain perception. Ronald Melzack and Patrick Wall termed this experience as “The Gate Control Theory of Pain Perception.” According to Melzack and Wall (1988), within our nervous system lies a gating mechanism that can block the transmission of pain sensations at the level of the spinal cord. Listening to music can close the gate inhibiting the transmission of pain signals carried by small nerve fibers and

preventing those pain signals from reaching the brain. Music provides competing impulses for other stimuli such as pain, and this results in less pain perception (Krout, 2007).

Music as a nursing intervention can be traced back to Florence Nightingale as she wrote in “Notes on Nursing” (1854), “The effect of music upon the sick has been scarcely at all noticed...the human voice and stringed instrument capable of a continuous sound have generally a beneficent effect” (p. 55-56). Passive music listening does not fall within the realm of “clinical music therapy” as the patient does not engage with a therapist in active techniques; rather, they only listen or recorded music. Passive music listening can easily be integrated into the burn centers’ routine practice as it is safe, non-invasive, cost-effective, and requires minimal staff involvement.

Local Problem

The Arizona Burn Center at Maricopa Medical Center is Arizona’s only nationally verified burn center, a joint designation of the American Burn Association (ABA) and the American College of Surgeons (ACS), treating adult and pediatric burn patients from all over the southwestern US as well as the northern part of Mexico. The Arizona Burn Center receives as many as 750 new patients and over 5,000 patients annually, and an estimated 3,500 patients return annually for long-term outpatient follow-up care (Maricopa Integrated Health System, 2018). Many of these patients come from rural communities that surround Phoenix, Arizona. McDermott, Weiss, and Elixhauser (2006) reported a rate of (23.1 per 100,000 population) of inpatient admissions for burn-related injuries in people living in rural areas.

Rural residents face a multitude of healthcare disparities not usually seen from their urban counterparts. Rural residents have a higher incidence of disease and disability, higher rates

of poverty, higher chronic disease rates, and often no healthcare coverage (Health Resources & Services Administration (HRSA). Provider shortages in rural communities are as high as 57%, and many communities do not have specialized services such as mental health (Health Resources & Services Administration (HRSA), 2017). This geographic isolation creates many problems as it is not possible to address the medical and mental well-being of the burn victim, leaving many to travel long distances to access specialized services. This task alone may be impossible for many as it takes hours out of one's day, and many may even sacrifice a day's work.

According to the U.S. Fire Administration (USFA) (2017), rural communities have the highest fire incident and fire death rates. Furthermore, nearly half of the total U.S. rural population resides in the Southeast region. Some 35% of all rural fires occur in structures, and the leading cause of these structural fires or residential fires is heating (Federal Emergency Management Agency, 2007). Heating equipment such as poorly maintained kerosene heaters or creosote build-up in chimneys accounts for 26% of these fires (Allareddy, Peek-Asa, Yang, & Zwerling, 2007). The sad reality is that 58% of these fires occurred in homes without smoke alarms (Federal Emergency Management Agency, 2007).

Rural residents are sadly twice as likely to die before they arrive at a hospital after a fire-related incident (Peek-Asa, Zwerling, & Stallones, 2004). The rise in mortality rate is possibly linked to the long response time that emergency medical services (EMS) take to reach these isolated homes. In 2009, a study by Klein et al. reported that 80% of the US population lives within two hours by ground or rotary air transport of a verified burn center. Ground transport to any self-reported burn center was highest in the Northeast (52.7%, 83.1%, & 98.0%) and lowest in the South (27.4%, 54.8%, & 87.6%). Such findings may very well play a role in the clinical

differences seen between burns in rural and in urban areas. Studies by Vidal-Trecan et al. (2000) and Duke, Rea, Semmens, and Wood (2012) found that rural burns were more severe than urban burns: deeper, involved a more substantial body surface area and caused more deaths.

These disparities need to be taken into consideration when caring for burn patients from rural communities. Efforts should be made to ensure that these rural burn patients receive adequate and integrated psychiatric follow-up services. Focusing on one's mental health outcome should be of top priority in burn centers because most burn patients come from rural/medically underserved geographic locations where psychiatric and mental health treatment is almost non-existent. Implementing therapeutic interventions such as music during dressing changes is beneficial and may decrease the psychological sequelae seen with burn treatment. Arizona Burn Center nurses had used music intervention informally and sporadically. Nursing staff had used unit iPods during dressing changes, at the nurses' discretion and personal preference. Preliminary feedback indicated a positive impact on patients and nurses. Burn unit staff expressed the need for more formal implementation and evaluation of the use of music as an adjunctive therapy during dressing changes on their unit.

Purpose

The purpose of this project was to evaluate the effectiveness of patient-selected music intervention on anticipated anxiety before routine dressing changes and to assess nurses' perception and practice related to the use of music as a therapeutic intervention for the management of anxiety in the unit's burn population at the Arizona Burn Center. This project aimed to reduce burn patients' anxiety before dressing changes while also providing the nursing staff with information on the benefits of music intervention in procedural anxiety and pain at

Arizona Burn Center. The ultimate hope is decreasing both the short term and the long-term impact of burn care, including psychological effects seen in many burn patients, primarily PTSD. Music intervention may also offer nurses caring for these patients an additional tool to enhance patient care, as well as mitigate potential compassion fatigue and burnout. This project serves as a pilot to assess potential feasibility of incorporating music intervention into care for burn patients at this center.

Study Questions

1. Does an evidence-based non-pharmacological music intervention reduce the anxiety associated with anticipated procedural pain in burn patients at the Arizona Burn Center?
2. What are nurses' perceptions relating to the use of music as a therapeutic intervention for the management of patient anxiety during dressing changes at the Arizona Burn Center?
3. How is music intervention being utilized during dressing changes?

Literature Review

This section will provide a review of the literature as it pertains to music therapy and its effectiveness in decreasing emotional distress in the burn population. The theoretical framework, as well as the conceptual model, is presented, followed by a brief explanation of the concept of anxiety.

Search Method

Because some standardized scales originated more than twenty years ago, articles published from 1995 through 2018 were included in this search. The following terms were searched for in PubMed, Cumulative Index of Nursing and Allied Health Literature (CINAHL), Psychinfo and Excerpta Medica Database (EMBASE): *Music therapy, passive music listening,*

music intervention, music medicine, pain, anxiety, anticipatory anxiety, burn, burn injury, burn trauma, dressing changes, wound care, debridement, acute stress disorder (ASD) and post-traumatic stress disorder (PTSD). The search yielded 181 articles. To ensure that the articles were relevant to the specific focus, inclusion, and exclusion criteria were identified. Inclusion criteria for studies were: 1) prevalence of posttraumatic stress symptomatology measured with standardized measures; 2) burn injuries met one or more of the American Burn Association criteria for major burn injuries; and, 3) music was the main intervention method used. Studies were excluded if they were not written in English, did not measure pain or anxiety, and if the initial assessments were not obtained within 14 days of burn injury. A total of 19 studies were found that met this criterion. Research articles reviewed included: systematic reviews (n=2) randomized controlled trials (n=4) and longitudinal cohort designs (n=8). The overall quality of evidence for each article was determined using the level of evidence model by Melynck and Fineout-Overholt (2015).

Psychological Outcomes

One systematic review and eight longitudinal studies were chosen to discuss the psychological ramifications of burn injuries (Difede et al., 2002; Dyster-Aas, Willebrand, Wikehult, Gerdin, & Ekselius, 2008; Giannoni-Pastor, Eiroa-Orosa, Fidel Kinori, Arguello, & Casas, 2016; McGhee et al., 2011; McKibben, Bresnick, Wiechman Askay, & Fauerbach, 2008; Palmu, Suominen, Vuola, & Isometsä, 2011; Taal & Faber, 1998; Tedstone & Tarrier, 1997; Van Loey, Maas, Faber, & Taal, 2003) (Appendix I). Acute stress disorder and posttraumatic stress disorder (PTSD) were the most common psychiatric disorder seen in burn survivors' although its prevalence varied by study. A systematic review of studies (n=24) by Giannoni-Pastor et al.

(2016) reported that ASD at baseline in burn patients ranged from 2% to 30% (Difede et al., 2002; Tedstone & TARRIER, 1997) and prevalence of PTSD ranged from 3% to 35% at 1-month (McKibben et al., 2008; Palmu et al., 2011), 2% to 40% between 3-6 months (Palmu et al., 2011; Perry, Cella, Falkenberg, Heidrich, & Goodwin, 1987), 9% to 45% in the year post-injury (Dyster-Aas et al., 2008; Perry et al., 1987) and ranged 7% to 25% more than two years later (McKibben et al., 2008; Van Loey, van Son, van der Heijden, & Ellis, 2008). This variability could be a result of the psychometric instruments used or the time point of assessment. Acute stress disorder (ASD) was seen in 21% of participants as early as 72 hours following a burn injury (McKibben et al., 2008). Studies by Difede et al. (2002); McGhee et al. (2011); McKibben et al. (2008); Taal & Faber (1998); Van Loey et al. (2003) investigated predictors of PTSD development. Their findings revealed that life threat perception, acute intrusive symptoms, and pain were the strongest predictors in the development of PTSD within burned patients.

According to Perry et al. (1987); Taal & Faber (1997); and Van Loey et al. (2003) a correlation is seen between pain and anxiety where anxiety related to procedural pain can contribute to the development or maintenance of post-traumatic stress symptoms. In early publications Perry et al. (1987) and Taal & Faber (1997b) reported a strong association between PTSD and a patient's pain perception. These two studies determined that patients who worried excessively about painful procedures developed anticipatory anxiety, which in turn enhanced their pain predisposing them to PTSD. Aaron, Patterson, Finch, Carrougner, and Heimbach (2001) demonstrated that anxiety is a significant predictor of procedural pain during dressing change and accounts for 40% of the variance of reported burn-related pain. These findings were further evaluated by Van Loey, Maas, Faber, and Taal (2003) and McGhee et al. (2011), in

which they also found that threat perceptions, intrusive memories, and pain-related anxiety predicted posttraumatic stress symptoms in patients 1-year post burn. Interesting enough, Van Loey et al. (2003) also mentioned a correlation between PTSD symptom severity at 12 months with a patients' TBSA and length of hospitalization. This association between total body surface area (TBSA) and PTSD has been greatly disputed in various articles. Still, this connection may not entirely be unfounded since patients with a greater TBSA generally require more operations resulting in repeated exposure to painful dressing changes and pain-related anxiety.

Psychometric Scales for ASD and PTSD

As discussed earlier, PTSD is the most prominent disorder seen in burn victims, but the prevalence rates are variable and may result from the various psychometric instruments being used. According to a systematic review of studies (n=24) by Giannoni-Pastor et al. (2016), significant disparities in prevalence rates were seen when researchers used diagnostic interviews versus screening questionnaires. Many standardized screening tools are available to capture the severity and prevalence of psychological symptomatology in the clinical setting. Five different screening tools were seen in this literature review. Intrusive and avoidant PTSD symptoms were measured by Difede et al. (2002); Palmu et al. (2011); Taal and Faber (1998); Van Loey et al. (2003) and Tedstone and Tarrier (1997) utilizing the impact of event scale (IES). The IES scale is a self-reported instrument used to evaluate distress in response to a specific traumatic event and only measures the reaction to the trauma (Motlagh, 2010). Difede et al. (2002); Dyster-Aas et al. (2008); Palmu et al. (2011) and Perry et al. (1987) used the structured clinical interview for DSM-IV (SCID) to evaluate for psychopathology at baseline and also at follow-up appointments. The SCID is an interview guide that consists of open-ended questions and is administered by a

mental health professional. McKibben et al. (2008) and Difede et al. (2002) captured ASD symptomatology using the Stanford acute stress reaction questionnaire (SASRQ). The SASRQ is a self-report measure that assesses the symptoms of ASD, including acute dissociation and anxiety after a traumatic experience. Furthermore, in their study, McKibben et al. (2008) chose to assess PTSD symptomatology using the Davis trauma scale (DTS). The DTS is a self-report scale that assesses the frequency and severity of PTSD symptoms. Lastly, McGhee et al. (2011) used the PTSD checklist-military (PCL-M), which is a screening tool authorized for use by the US military.

All these studies used a longitudinal research design within their screening time points. Studies by Perry et al. (1987); Taal and Faber (1998); Van Loey et al. (2003) and Dyster-Aas et al. (2008) screened patients during their first week of hospitalization and continued until 24 months post burn. Other researchers chose a shorter time frame but still were able to provide significant insights into the development of psychological disorders in burn patients.

Scales for Pain and Anxiety

Five different instruments were found to be used in this literature review to assess and measure anxiety and pain symptomatology in the burn population. The visual analogue scales (VAS) and the Wong-Baker faces rating scale (WBFRS) were used to screen for pain. The burn specific pain anxiety scale (BSPAS), the muscle tension inventory scale (MTIS), and the Trippet objective muscle relaxation inventory (TOMRI) were used to measure for anxiety levels, muscle tension, and emotional distress. Studies by Taal and Faber (1998); Van Loey et al. (2003) and Palmu et al. (2011) reported that pain levels appeared to be influenced by the patients' anticipation of future painful procedures. This level of fear and anxiety was termed as a life

threat perception that left the patient experiencing intrusive thoughts or traumatic memories. These studies found that life threat perception, acute intrusive symptoms, and pain were the strongest predictors in the development of PTSD within burned patients

Supporting Literature for Music Interventions

Treatment during the acute phase of burn management can have a significant impact on a patients' psychological recovery post-burn. A systematic review of studies (n=17) by Li, Zhou, and Wang (2017) found that music interventions distinctly reduced pain and anxiety in individuals compared to their counterparts. Four articles were chosen as they explain how music therapy has shown a positive effect on alleviating pain and decreasing anxiety among burn patients (Appendix J).

A recent study by Najafi Ghezeljeh, Mohades Ardebili, Rafii, and Haghani (2016) evaluated the effect of music on the background pain, anxiety, and relaxation levels in burn patients. As we recall, background pain is experienced when the burn patient is at rest and is described usually as dull and can be constant or intermediate. Researchers asked the participants in the intervention group to rate their pain, anxiety, and relaxation level using a visual analog scale before and after music intervention. The music intervention consisted of the participants listening to music by headphones for 20 minutes while in their room. The participants were instructed to close their eyes and focus on the music. The control group did not receive any music intervention. The results showed that music intervention not only reduced background pain levels and anxiety in burn patients, but it also increased their relaxation levels (pain $P < .001$, anxiety $P < .001$, and relaxation $P < .001$) compared to those in the control group.

In another study conducted by Najafi Ghezeljeh, Mohades Ardebili, Rafii, and Haghani (2017), the effects of patient-preferred music on anticipatory anxiety were evaluated on post-procedural burn pain and relaxation levels. Although the researchers allowed for patient-preferred music, the researchers selected the selection the patients chose from. The participants listened to the music selection once a day for 20 min for three consecutive days before wound care procedures. The participants' anticipatory anxiety, pain intensity, and relaxation levels were measured at three different intervals: before playing music, immediately after the wound care procedure and again 10-15 minutes after the wound care procedure. Data was measured using the Persian version of the BSPAS and the VAS. The study found that listening to preferred music, along with the use of analgesics, only reduced the anticipatory anxiety level immediately after the wound care procedure compared to patients that did not receive music intervention. There was, however, a statistically significant difference in the mean score of pain intensity ($t = -4.26$; $p < 0.001$) and relaxation level ($t = -5.66$; $p < 0.001$) between the intervention and control group at 10-15 minutes after the wound care. As with other studies, music did not decrease pain intensity or anxiety during the wound care procedure.

Studies by Fratianne et al. (2001) and Tan, Yowler, Super, and Fratianne (2010) evaluated the effects of musical alternate engagement (MAE) and music-based imagery (MBI) before during and after debridement procedures. Both studies measured pain and anxiety levels and also the nurse observation of muscle tension. The tools utilizing included: the visual analog scale (VAS), Wong-Baker faces rating scale (WBFRS), muscle tension inventory scale (MTIS) and adapted Trippet objective muscle relaxation inventory (TOMRI). In Fratianne et al. (2001) study, the researchers collected data at four different time intervals: in the patient's room before

transfer to the treatment room, in the treatment room during debridement, in the treatment room after debridement and upon returning to the patient's room. MBI was provided in the patient's room 15 to 30 minutes before and after the procedure. MAE was provided during the dressing change. Both these studies used a music therapist to provide these active music interventions. Fratianne et al. (2001) reported that MBI significantly reduced patients' perception of pain in the debridement process ($P = 0.008$) and ($P = 0.004$), but music therapy was less effective during debridement. A reduction of anxiety was not statistically significant ($P = 0.088$). In the Tan et al. (2010) study, the researchers collected data 20 minutes before the patient was taken to the treatment room, immediately after MBI, upon arriving in the treatment room, immediately after the debridement process, at the end of the dressing change, at bedside after dressing change and at the end of another MBI session. The MBI sessions were provided in the patient's room before and after the dressing change. MAE intervention was provided during the dressing change procedure. Tan et al. (2010) reported significant decreases in pain levels before ($P < .025$), during ($P < .05$), and after ($P < .025$) dressing changes on days the patients received music therapy compared with control days. A decrease in anxiety levels was also significant during dressing changes ($P < .05$) and a decrease in muscle tension levels reached significant differences during and after dressing changes ($P < .05$ and $.025$, respectively).

In summary, literature has demonstrated that pain intensity and anxiety can have a significant impact during the acute phase of treatment for burn patients. The prevalence of PTSD, as well as other psychological disorders, is high, and psychological intervention that focuses on relieving pain intensity and anxiety is necessary. Music intervention could be

routinely implemented during dressing changes and is simple and effective in controlling pain and anxiety.

Gaps in Literature

This literature review provided vital insight into the long-term psychological consequences seen in burn survivors as well as demonstrated the effectiveness of music intervention on pain and anxiety before and after burn dressing changes. Many inconsistencies were found in the studies regarding rating scales utilization. Studies in this literature review utilized various instruments, but they are not specific for pain or anxiety assessment in burn patients. This inconsistency presents a gap in current knowledge and practice. There were also no studies that reported any information related to the impact that burn injuries have on the nurses. The clinical challenges seen in burn injuries can be stressful and frustrating to many nurses, especially if they feel helpless and unable to provide optimal care. Music interventions offer many advantages, one being that it can provide comfort not only to the patient but also to the surrounding medical staff. Reporting how music therapy is being implemented in different burn centers and the overall clinical satisfaction is vital in determining if the intervention is sustainable and worth exploring.

Theoretical Framework

The utilization of theoretical frameworks in research is crucial as they provide a foundation to guide nursing practice, understand human experiences, and ultimately promote positive outcomes for patients. Katharine Kolcaba's comfort theory is geared towards promoting comfort to patients through holistic nursing care. Kolcaba developed her theory in 1991, and it describes comfort as a multifaceted emotion that is achieved in phases: relief, ease, and

transcendence. These phases occur in various contexts: physical, psychospiritual, environment, and sociocultural (Kolcaba, 2011). Relief is achieved when the patients' specific comfort needs are met. Ease is a comfort that focuses on the psychological state of the patient and the absence of specific discomfort (Kolcaba, 2007). Transcendence, according to Kolcaba 2011, occurs when the patient can rise above their challenges resulting in patient satisfaction and a sense of wellness.

Kolcaba describes four contexts in which comfort is experienced: physical, psychospiritual, environmental, and sociocultural. The physical context pertains to bodily sensations experienced by the patient, for example, pain, pain relief or bowel function. Nurses provide comfort by providing an intervention that promotes an outcome, such as administering medications. The psychospiritual context pertains to the patient's internal awareness of self or their meaning in life. Nurses can promote comfort in a psycho-spiritual aspect by maintaining and improving self-esteem, enhancing relaxation, providing reassurance, and promoting independence. The context of the environment in Kolcaba's theory pertains to discomforts associated with the patient's external background. An example of an environmental discomfort often experienced by a burn patient during their dressing change is the temperature of the room where the dressing is taking place. A simple intervention by the nurse would be to increase or decrease the temperature of the room to provide comfort to the patients. The last context, sociocultural, pertains to interpersonal relationships held by the patient and how nurses can provide comfort or encourage these relationships within their hospitalization. Patients who sustain burn injuries may remain hospitalized for a prolonged period. This prolonged period not only provides stress in many personal relationships but can produce anxiety to the patient, as the

healing time is not always as expected. Instilling hope, listening to concerns, and providing reassurance with information are all interventions that promote comfort in these situations.

This theory is used to help guide the assessment of a patient's comfort needs, implement comfort measures to address those needs, and evaluate comfort levels following implementation. Kolcaba's theory of comfort can be adapted in the burn center as a framework for providing holistic interventions to address a patient's anxiety and pain during their hospitalization. As described above, anxiety is a discomfort seen in burns patients and experience prior, during, and after their dressing changes. This discomfort can have an adverse effect on the patient's ability to cope, often creating fear and the feeling of helplessness. Although music therapy mostly targets the human need of transcendence as this intervention helps the patient rise above discomfort that cannot be eradicated or avoided, it can also be applied to the environmental and socio-cultural context of comfort. Music can reduce the background noise during a dressing change and can also be customized to their cultural preference. Complementary and alternative medicine (CAM) approaches focus on a human being as a whole and include non-traditional elements of health such as physical, psychological, environmental, and spiritual (Frisch, 2001). Integrating this theory into nursing practice encourages holistic patient-focused nursing care and promotes the well-being and comfort of patients throughout the burn center.

Conceptual Model

Changing clinical practice is not only complex but also challenging. Effective implementation of evidence-based findings is crucial to improving the quality of healthcare. The evidence-based practice framework used as the groundwork for implementation is The Stetler model of evidence-based practice. This model has been successful in facilitating change with the

use of evidence-based practice. The Stetler model was initially published in 1976 by Cheryl Stetler and has since undergone three revisions to accommodate internal and external factors that could influence healthcare changes (Stetler, 2001). The Stetler model was founded on the idea that knowledge and behavior of others can be affected by their internal characteristics, as well as the external environmental factors they are exposed to (Stetler, 2001). According to Stetler, research utilization in practice can occur in three ways: the direct and concrete application of knowledge; by changing the way one thinks about an issue; or by influencing the thinking and behavior of others (National Collaborating Centre for Methods and Tools, 2011). The Stetler model of evidence-based practice consists of five phases: preparation, validation, comparative evaluation and decision-making, translation and application, and the final step of evaluation (Stetler, 2001). Each of these phases is designed to facilitate critical thinking, lessen some of the human errors in the decision-making process, and incorporate the reliable evidence to the setting of practice.

The Five Phases

In phase one, the preparation phase, the clinical issue is identified, and a literature review is conducted to seek out the evidence. Stetler (2001) points out that systematic literature reviews should be sought out with any literature that is specific to the EBP question. A systemic literature review should identify both internal and external factors that may influence the feasibility of implementing the research findings. These internal and external factors include individual beliefs, resource availability, timelines, and stakeholder readiness. The goals and desired measurable outcomes should also be defined. The clinical issue concerning this project is the need to incorporate nonpharmacological interventions like music listening in our burn center.

The second phase consists of the validation of the chosen literature. Validation includes rating the quality of each source, determining the clinical significance, and critiquing the research with utilization in mind (Romp & Kiehl, 2009). The evidence is then summarized, and the level and quality are rated using a level of evidence scale. Melnyk and Fineout-Overholt (2011) levels of evidence model was utilized to rate the literature in this project. Evidence on the use of music in burn patients was sought out and detailed in the literature review of this DNP project.

In the third phase, comparative evaluation and decision-making require an evaluation of the evidence and its utilization to the practice setting. According to Stetler (2001), evaluation should determine the fit of the setting as well as the feasibility of the project, the substantiating evidence, and the current practice. Is the evidence substantiating in terms of the overall strength of the findings? Does the evidence fit the proposed setting? Is the project feasible? Are the findings significant enough to change the current practices? Based on these questions, a decision is made to use the evidence, delay its use, and conduct based on local need, or to reject the evidence. For this quality improvement project, a small pilot is needed to evaluate the effects of music on anticipated anxiety as well as the overall strengths of the findings. It is also important to evaluate the current utilization of music in the burn center as well as the nurses' perception of music as a therapeutic intervention.

The fourth phase translation/application involves determining how to move forward and identify practice implications. In this step, a plan is created, and a decision is made on what form to utilize the research. The research could either be instrumental, conceptual, or symbolic. Each of these forms depicts how knowledge is presented to the clinical setting. It is then determined if

the evidence will be used to influence an individual, a group, or an organization. Lastly, an informal or formal method of use for the application of evidence is selected. For this DNP project, translation of these findings indicated a need for a practice change in the burn center. To proceed with this change, an instrumental research approach is used to pilot a music intervention.

The fifth and final phase focuses on evaluation. The use of the evidence is evaluated to determine if it was valuable to the clinical setting. Did the evidence have an impact on the practice setting? If a pilot was implemented, the outcomes are then compared to the desired outcomes stated in phase one.

Concepts

Anxiety is a typical response that many individuals face when presented with new life experiences. It is normal and common for individuals to experience a general state of worry or fear when admitted to a hospital. Patients can feel apprehensive about their new diagnosis, fearful about the plan of care, and overwhelmed by the information they are receiving. Anxiety has many physiological manifestations as it can cause an increase in blood pressure and heart rate, which can cause palpitations and trembling, and lead to nausea or vomiting. In extreme situations, the individual may experience chest pain and feel short of breath. Negative behavior, such as irritability, avoidance, and noncompliance in treatment, is also associated with anxiety. In burn patients, anxiety can occur in the presence of many other components such as pain, pruritus, grief, and other distress.

Anticipated anxiety or anticipatory anxiety is anxiety that begins with anticipation or a sense of fear related to a painful situation (Robert, Blakeney, Villarreal, & Meyer, 2000). In burn patients, anticipatory anxiety related to upcoming procedures can further exacerbate pain and

provoke more anxiety. Anticipatory anxiety can also worsen over time, and this heightened anxiety can cause the patient to become more vigilant to pain signals, ultimately experiencing more intense pain than those with lower levels of anxiety. According to Solowiej, Mason, and Upton (2009), stress and anxiety can delay wound healing as stress can lead to raised levels of cortisol, which can negatively affect immunity and the body's inflammatory response. By focusing on providing additional methods to decrease anxiety before and during procedures, patients may experience a reduction of pain and a reduced risk of developing long-term psychological disorders (Taal & Faber, 1997).

METHODS

Design

This quality improvement project used a one-group, pre- and post-test design to measure the effectiveness of the patient-selected music intervention on anticipated anxiety. A Likert scale survey was used to determine the nurses' perspectives of music as a therapeutic intervention for decreasing anxiety.

Setting

This quality improvement project took place at the Arizona Burn Center (AZBC), a 45-bed facility located in Phoenix, Arizona. This facility was chosen because it is the second-largest burn center in North America and treats over 5,000 patients annually, many of those who travel from rural areas. In addition, this facility is nationally recognized for its top-ranked burn care and research. The burn center consists of two different units, the intensive care unit, and the step-down unit. The intensive care unit cares for critically ill patients, both adult and pediatrics, that require a high level of nursing care. In this unit, every patient has a private room, and the

majority of the dressing changes are performed in the patient's room solely because many of the patients are mechanically ventilated. The medical floor consists of both private and shared rooms, and the majority of these have their dressing changes in a designated wound care shower. These two units employ a total of 110 nurses who are assigned to either unit on any given day.

Sample

Burn patients were invited to participate in the project if the following inclusion criteria were met: 1) English speakers; 2) 18 years of age or older; 3) admitted to either inpatient unit of the Arizona Burn Center (AZBC), and 4) have an estimated length of stay greater than four days. Exclusion criteria included: 1) burns to the ears as it will prevent earbud placement; 2) intubation as this will prevent the completion of the self-assessment scale; 3) have undergone any form of graft placement because these patients follow a different procedural schedule and 4) individuals under the age of 18, primarily because the chosen tool is not validated for the use in children. The target sample was six patients with a minimum of four.

Registered nurses were considered participants in this project if they participated in the participating patients' dressing change procedure. The inclusion criteria for these nurses included: 1) staff of the Arizona Burn Center and 2) had their patient selected for the music intervention. Exclusion criteria included 1) contract employee or registry nurse. Because approximately 18 to 20 nurses are working on any given shift, the target sample was 12 nurses with a minimum of eight.

Recruitment

An email was then sent to the Arizona Burn Center's Medical Director, Nursing Manager, Clinical Nurse Leaders, and the AZBC Research Coordinator that included disclosure

forms for nurses and patients, scale and survey copies, and recruitment form. A meeting with the Nursing Manager and Clinical Nurse Leaders was held the following week in which questions and concerns were addressed, and a starting date was set. The following day, recruitment flyers (Appendix B) were placed in the AZBC break room, and both female and male locker rooms outlining the purpose of the DNP project and listed the dates of the upcoming in-person education sessions as well as the primary investigators' contact information. The in-person education sessions took place from September 20-September 27 and were held at the start of every shift in the AZBC break room. This brief session took approximately eight minutes to present and discussed the purpose of the project, along with a short description of how the intervention would take place. Questions were answered, and disclosure forms were handed out to the nursing staff. Nursing participation was voluntary, and no incentives or rewards were offered. An email was sent out to those nurses who requested additional information.

Patient participants were recruited and selected based on the inclusion criteria by this investigator. All patients that met criteria during the project period were approached during their admission to the burn center. When a new admission arrived at the burn center, the clinical resource leader on duty was asked to provide a courtesy text to the investigator. The text did not contain any personal identifying information but simply alerted the investigator of any new admissions that arrived at the AZBC. This investigator would then go to the burn center to obtain verbal clinical information from either the resident physician assigned to the patient or the nurse. If no courtesy text were received, the primary investigator would visit the burn center each morning to identify any new admission then proceed to screen for inclusion criteria.

Intervention

Disclosure forms were given to patients that chose to participate, then they were handed an iPad and asked to create a one-hour playlist by selecting music from an online digital music service. The playlist was then saved under the patient's unique project identification number assigned to them by the investigator. The iPad was necessary to select music from the digital online music because it had Wi-Fi compatibility. This iPad belonged to the investigator and remained in her possession throughout the project. The music from the playlist was then uploaded to the investigator's private computer and electronically uploaded to a small iPod Nano. A smaller device like the iPod Nano was required because the iPad was too big to use for the music intervention. The iPod Nano is compact and thin with dimensions of 2.75 x 2.06 x 0.26" The iPod Nano was also housed in a waterproof plastic case to allow the patient to use it in the shower.

There were two different time periods for the music intervention: during the patients third dressing change and during the patients fourth dressing change. This exposure was important as it ensures that the patient received at least two dressing changes before any data was collected. The patient was given disposable earbuds to have throughout their participation. The intervention began as soon as the patient arrived in the dressing change room. The patient was presented with the iPod Nano, and their selected playlist was started. The patient controlled the volume during the listening experience as well as the placement of his or her earbuds. The investigator remained outside the shower room throughout the entire dressing change to assist with the iPod Nano or any other technical issues that could arise. After the dressing change was completed, the music was turned off, and the patient returned the iPod Nano to the investigator. The device was then

disinfected and stored in the investigator's locker until the next intervention. The patient was asked to keep the earbuds for their future intervention.

Data Collection

Patient Anxiety Assessment Tool

The tool chosen to evaluate patient anxiety symptomatology was adapted from the burn specific pain anxiety scale (BSPAS). The BSPAS is a validated 9-item self-reporting scale that detects feelings of anticipated anxiety in patients with burn injuries (Taal & Faber, 1997a). The adapted scale is a 5-item self-reporting scale where each item is answered on a visual analogue line ranging from '0' to '10,' and the total score is calculated by adding up the scores of all items (maximum 50 points) (Appendix E). The score indicates the patient's level of anxiety about painful procedures with a higher score indicating a higher level of anxiety. The BSPAS can also predict procedural pain levels as rated later the same day relative to other global anxiety measures (Aaron, Patterson, Finch, Carrouger, & Heimbach, 2001). The participants completed this scale before the start of their third dressing change and then again before the start of their fifth dressing change.

Patient Baseline Data

The following baseline clinical data was verbally obtained from the nurse or provider assigned to any new admission to the burn center: the cause of the burn (scald, flame, electricity or contact); percent total body surface area (TBSA); burn degree and part of the body affected (Appendix C). If the patient met inclusion criteria and was invited to participate, a questionnaire was used to obtain their demographic information: their age, gender, and ethnicity, past medical history, which also included past psychiatric diagnosis (Appendix D).

Nurse Satisfaction Tool

Nurses whose patient was chosen to participate were given a four-question survey created by this investigator that was used to measure their awareness and perception of music interventions (Appendix F) at the end of each participant's music intervention. The responses were scored using a Likert scale ranging from '1' to '5.' The first question assesses the nurses' perception of music therapy in relation to its effects on anxiety. The second question assesses the nurses' awareness or knowledge of music therapy as an intervention for the management of anxiety. The third question assessed the nurses' current utilization of music in their day-to-day practice. The fourth question assessed the potential feasibility of the music intervention program in the burn center.

Data Collection Methods

As mentioned before, the data for the music-listening intervention were collected at two separate time frames. The BSPAS data was collected before the patient's third scheduled dressing change and again before their fifth dressing changes. These time frames were selected because, in the AZBC, patients typically follow a burn-dressing schedule consisting of twice a day dressing for the first three days following a burn injury. See the timeline below (Figure 1).

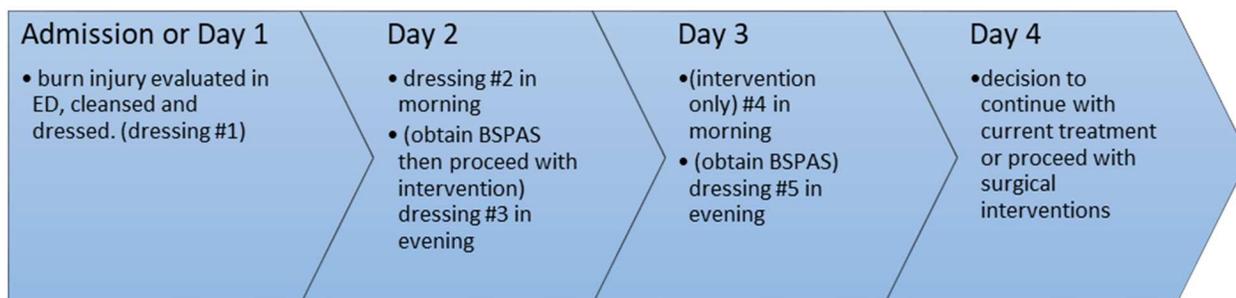


FIGURE 1. Music intervention timeline.

To help identify all the information collected, each participant was assigned a unique study identification number. The identification numbers for the patients were P1, P2, P3, and so forth; the assigned study identification numbers for nurses were N1, N2, N3, and so forth. This investigator maintained a separate, locked, encrypted, password-protected Excel spreadsheet containing the participants' initials and study identification numbers. This Excel spreadsheet was kept in the primary investigator's password-protected personal laptop. This was used only during the study to ensure the proper playlist and pre- and post-intervention surveys were used for the correct patients. This file was deleted after the completion of the project.

After the patient answered the questions of the BSPAS, they were given disposable earbuds and instructed to begin listening to their preselected music list from the iPad. At the same time, the burn team proceeded with the routine dressing change. The staff medicated the patient as needed based on the patient's prescribed orders. At the end of the dressing change, the music stopped, and the patient was then transferred back to their room. At the patient's next dressing change, the patient was once again given the iPod and disposable earbuds to listen to their preselected music list. By repeating this intervention at the next dressing, the patient was allowed time to acclimate to the music intervention. At the end of this dressing change, the music intervention ceases, and the patient was once again escorted back to their room. Before their fifth dressing change, the patient was approached by this investigator and asked to answer the questions of the BSPAS. This data was used as the post-intervention data. This concluded the patient's participation. The patient was given an option to continue listening to his/her playlist or proceed without the music intervention. If they chose to listen to music, their playlist was downloaded onto an MP3 player that had Bluetooth capability to stream while they were in the

shower room. The playlist was stored under any name or identifier the patient chose because this device was shared between participants. Because there are only two showers used to perform dressing changes in the burn center, only one device was needed. The device was disinfected after each use and kept in the investigator's locker.

Data Analysis

SPSS Edition 26.0 was utilized to analyze all of the data collected. Descriptive statistics were used to describe the participants' demographic data (i.e., age, gender, ethnicity, and past medical history) as well as their clinical data. A one-group paired sample t-test was used to compare the difference of two means, the pre BSPAS score with the post BSPAS score. Frequency tables were used to display the nurses' responses to the four-question Likert survey. The scores were averaged to find the mean, standard deviation, and percentage of each concept.

Ethical Considerations

Site approval was obtained, and The University of Arizona Institutional Review Board (IRB) reviewed the implementation of this quality improvement project (Appendix A). The disclosure forms utilized for this quality improvement project detailed the purpose of the study (Appendix G & H), voluntary participation, whereby participants may withdraw at any time without penalty, the protection of confidentiality, the contact information of the primary investigator (PI) and the benefits and risks to the participants. The anonymity of the participants was considered throughout the process, and terms are included in the disclosure. Autonomy was preserved in this project as patients were advised that they could excuse themselves from the study at any time. Responses to any and all forms were voluntary. To ensure confidentiality and compliance with the Health Insurance Portability and Accountability Act (HIPAA), study codes

were used to protect the confidentiality of participants and stored in a locked, encrypted, password-protected laptop only assessable to this investigator. In addition, no identifiable information was collected on the data forms. To ensure justice, the exclusion and inclusion criteria took into account the scope and objectives of the study and were not based on race, disability, or culture. All eligible participants based on inclusion criteria were invited to participate.

RESULTS

Introduction

The purpose of this DNP project was to evaluate the effectiveness of patient-selected music intervention on anticipated anxiety before routine dressing changes and to assess nurses' perception and practice related to the use of music as a therapeutic intervention for the management of anxiety in the unit's burn population at the Arizona Burn Center. This chapter will begin with an overview of the demographic data, followed by the research findings of the music intervention as well as the nurses' survey responses.

Demographic Data

The intervention period began on September 20, 2019 and ended October 25, 2019. A total of seven patient participants met inclusion criteria and were recruited to participate in this quality improvement project. There were 21 nurses caring for these above patients who also participated in this study; no demographic data were collected on nursing staff. Table 1 illustrates the demographic and clinical data of the patient participants.

The patient sample consisted of four males (N=4, 57.1%) and three females (N=3, 42.9%). The participants ranged in ages from 18 to 67 years old with a mean age of years. The

sample consisted of four Hispanics (67%), followed by one Asian (14%), one Caucasian (14%), and one African American (14%). These participants' past medical history varied; two patients suffered from depression, anxiety, and diabetes, one male had bipolar disorder, and the other four participants denied any medical or psychiatric diagnosis. The majority of the burns observed in these individuals were caused by scalding injuries (N=4, 57.1%). All but one participant endured burns to various parts of their body. Their TBSA burn ranged from 1.5% to 6% (mean 5.07, SD = 1.64) and 85.7% of the patients had partial-thickness burns. One patient (n=1, 14.3%) had a combination of partial and full-thickness burns. The 20 caring for these above patients also participated in this study; no demographic data were collected on nursing staff. Patient demographics and clinical data are shown below (Table 1).

TABLE 1. *Patient demographic and clinical data.*

Attribute		Participants	
		(N = 7) n (%)	Mean (SD)
Gender	Male	4 (57.1%)	
	Female	3 (42.9%)	
Age	18-24	1 (14.3%)	
	25-34	0	
	35-44	2 (28.6%)	
	45-54	1 (14.3%)	
	55-64	2 (28.6%)	
	65 or above	1 (14.3%)	
Ethnicity	Asian	1 (14.3%)	
	Black	1 (14.3%)	
	Hispanic/Latino	4 (57.1%)	
	White	1 (14.3%)	
Past Medical History	Anxiety	2 (28.6%)	
	Diabetes	2 (28.6%)	
	Depression	2 (28.6%)	
	Bipolar	1 (14.3%)	
	Cancer	0	
	Hypertension	0	
	Cardiac	0	
	PTSD	0	
	Schizophrenia	0	
Burn Factor	Scald	4 (57.1%)	
	Flame	2 (28.6%)	
	Contact	1 (14.3%)	
	Electrical	0	
Burn Depth	Superficial	0	
	Partial to full thickness	6 (85.7%)	
	Third	1 (14.3%)	
Burn Location	Left Leg	2 (28.6%)	
	Right Leg	1 (14.3%)	
	Left Hand	4 (57.1%)	
	Right Hand	2 (28.6%)	
	Left Arm	1 (14.3%)	
	Right Arm	1 (14.3%)	
	Left Foot	2 (28.6%)	
	Right Foot	2 (28.6%)	
	Right Thigh	2 (28.6%)	
	Anterior trunk	1 (14.3%)	
TBSA			5.07 (1.64)

Music Intervention

Anxiety levels were measured using the BSPAS tool. The mean pre-intervention scores were 36.17 (SD 13.67). Post-intervention mean scores were 30.42 (SD 15.34). A paired t-test analysis was conducted to determine if the impact of the music intervention was also statistically significant on decreasing anticipatory anxiety in the participants. Music intervention was found to be non-significant in decreasing anticipatory anxiety levels $t(6) = 1.629$, $p = 0.155$, $d = 0.61$, 95% C.I. [-3.68, 15.01]. The paired sample statistics, paired sample correlations, and pair sample t-test are shown in Table 2.

TABLE 2. *Paired samples statistics (correlations and t-test).*

	Mean	N	Std. Deviation	Std. Error Mean
Pair 1 Pre-Test Burn Specific Pain Anxiety Scale Score	36.4286	7	13.67305	5.16793
Post-Test Burn Specific Pain Anxiety Scale Score	30.4286	7	15.34989	5.80171

Paired samples correlations

	N	Correlation	Sig.
Pair 1 Pre-Test Burn Specific Pain Anxiety Scale Score & Post-Test Burn Specific Pain Anxiety Scale Score	7	.780	.038

Paired sample t-test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Pre-Test BSPAS- Post-Test BSPAS	6.00000	9.74679	3.68394	-3.0142	15.0142	1.629	6	.155

The bar chart in Figure 2 (below) shows the difference in scores of each patient. The following summaries detail each patient encounter for both of their music interventions.

Patient ID 1 with a past medical history of diabetes, asthma, depression, and anxiety was admitted with a scald burn to her anterior trunk, right thigh, right leg, and left foot. Her burn was estimated to have a TBSA of 6%. The participant chose her playlist and had a pretest BSPAS of 45. During the first intervention, it was observed that the patient had issues keeping the earbuds in her ear while she showered. New earbuds were purchased that would wrap around the ear to use on the next intervention. At the patient's second intervention, the new earbuds were used, and they stayed in place throughout the entire shower. The participant scored a 46 on the posttest BSPAS, indicating an increase in anxiety by one point.

Patient ID 2 was admitted with a scald burn to his bilateral feet with an estimated TBSA of 6%. This patient had a prior diagnosis of diabetes, depression, and anxiety. He chose to participate but was reluctant to create his music playlist; instead, he asked to have the playlist created by the investigator. He did request that the playlist contain alternative music but did not specify an artist. He was given the pre-BSPAS and scored a '10.' He revealed that he suffered from neuropathy, which may have indicated why he marked '0' to the questions inquiring about pain. During the first intervention, the patient did not keep both earbuds in his ears; instead, he chose to leave one of them out. He later expressed that not being able to listen to what others were discussing during his dressing change created an increase in anxiety, so by leaving an earbud out; he felt included in the conversations. For his second intervention, he kept one earbud in and one out. His post BSPAS score was '6.' The participant suggested that the facility be equipped with Bluetooth speakers so he could stream his music during future dressing changes.

Patient ID 3 was admitted with a scald injury to her bilateral hands, forearms, her right side abdomen, and her right foot. The estimated TBSA was 6%. This participant had no past medical history. The pretest BSPAS was 46. The patient selected her music playlist and wore earbuds throughout both of her interventions. The participant scored a 46 on the posttest BSPAS indicating no change from her pretest score.

Patient ID 4 was admitted after scald injury to his right thigh and left leg. His injuries were estimated at 6% TBSA partial to full-thickness burns. This patient had a past psychiatric history of bipolar disorder. His pre BSPAS total score was 45. The patient requested a music selection be created for him and choose artists such as BB King, Prince, and Marvin Gaye. He chose to wear earbuds during both of his music interventions. The patient sang along to his playlist during his dressing changes. Following the music intervention sessions, his post-BSPAS score was 19 showing a substantial 26-point drop in his anxiety level.

Patient ID 5, with no past medical or psychiatric history, was admitted with a scald burn to her left hand. Her TBSA was estimated at 1.5%. The participant displayed a high level of anxiety during the screening process due to the circumstances surrounding the accident and the financial burden foreseen. Her pre-BSPAS score was 26. She also did not want to create her playlist and requested that the investigator create one that contained music from guitarist Ottmar Liebert. During her first music intervention, the earbuds kept falling out of her ear, limiting her ability to listen to the music adequately. It was decided that on the next intervention, the playlist would be delivered via a Bluetooth speaker. Unfortunately, the burn center did not have a speaker with Bluetooth capabilities, so the music was streamed from the iPad during the patient's second music intervention. The patient's post BSPAS score was 21. The patient expressed

gratitude and requested that her playlist be used throughout her admission. The primary investigator purchased a speaker with Bluetooth capabilities. The patient was then able to use her phone to stream her music playlist.

Patient ID 6, with no past medical or psychiatric history, was admitted after a flame burn to his left lower leg and left hand with a 6% TBSA. His pre BSPAS total score was 45. This patient did not want to wear earbuds and requested that the music be streamed out loud in the shower room for both of his music interventions. Because only one Bluetooth speaker was purchased, the iPad was used to stream the patient's music playlist. The nurses noted that they observed the patient tapping his foot to the music during his dressing change. The patient also stated to the nurses that he found the music helpful. On evaluation, his post BSPAS total score was 35, demonstrating a lower overall anxiety level.

Patient ID 7 with no medical history was admitted following a flame burn to his right hand, left hand, left upper arm, and right arm. His estimated TBSA was 6%. The patient did not choose his songs for his playlist; instead requested that this investigator create a playlist with relaxation meditation/yoga music. The participant also did not want to wear earbuds because he wanted to be able to participate in dialogue with the medical staff. The playlist was streamed via the Bluetooth speaker for both of his music interventions. The pretest BSPAS was 38, and the posttest was 40. Although this participant's score increased, he requested to have his playlist available to him for future use because "the music helped me feel less nervous."

At the conclusion of their participation, many of the participants volunteered to provide feedback on the music intervention. One participant expressed how the music allowed her to focus on something familiar and feel less fearful of the unknown. Another patient pointed out

how music is part of her daily activities, and without it, she feels nervous. Even the patients that did not have a decrease in their BSPAS score shared positive feedback. All of the participants requested that their music playlist be made available for them during the remainder of their admission.

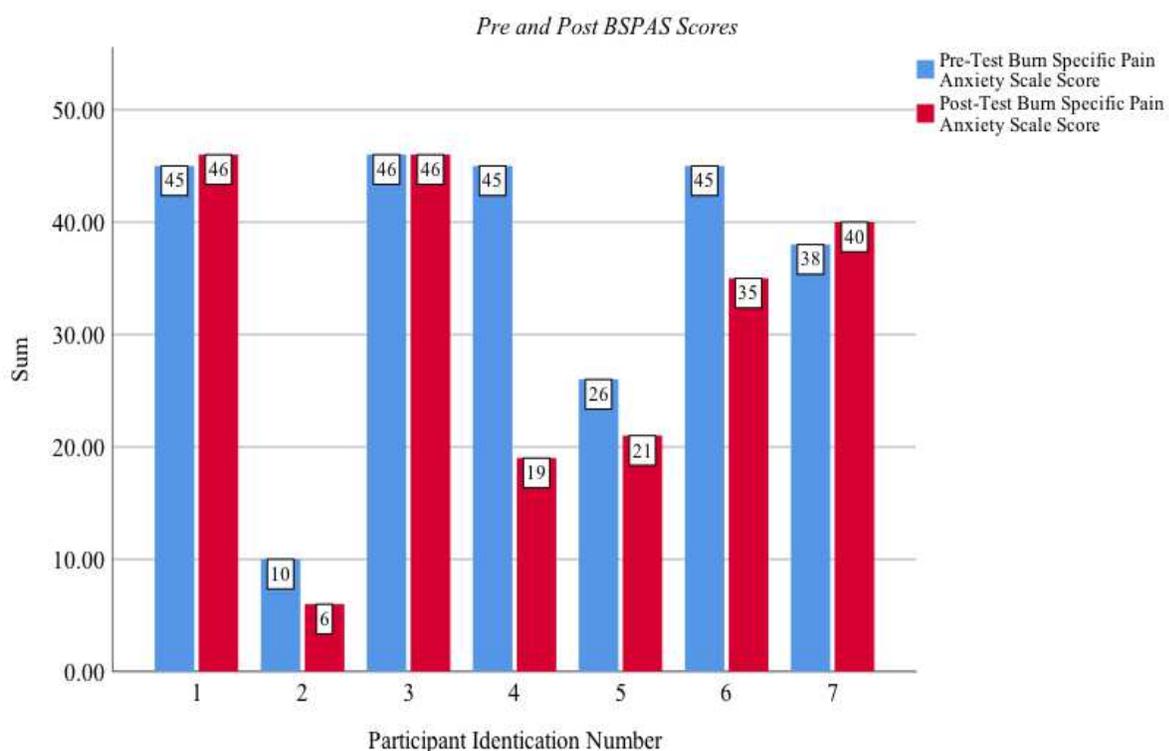


FIGURE 2. Scores of burn participant's pre- and post-BSPAS.

Nursing Survey Responses

A total of N=21 nurses completed the nursing portion of this quality improvement project. Following the intervention, nurses were asked to rate their agreement with statements on their perception, knowledge, utilization, and feasibility of music intervention in the burn center. It is necessary to point out that some patients had more than one nurse present during their intervention resulting in a higher number of nurse participants. The four questions were rated using a five-point Likert scale.

The first question assesses the nurse's perception of music therapy in relation to its effects on anxiety. Figure 3 shows the frequency distribution of the level of agreement with the statement, "I think that music can effectively reduce a burn patients' anxiety during painful procedures." A total of 62% (N=13) of the nurse participants marked "always," while 33% (N=7) marked "sometimes" and 5% (N=1) marked "every once in a while."

I think that music can effectively reduce a burn patients' anxiety during painful procedures.

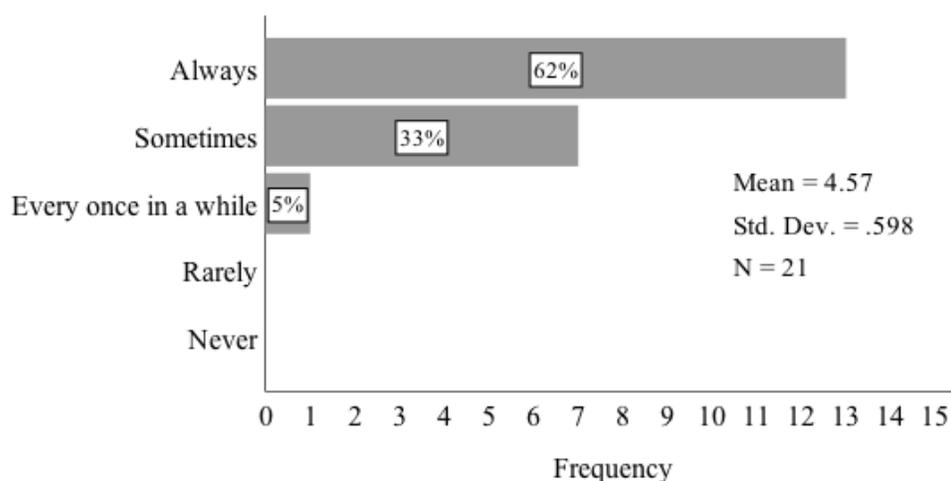


FIGURE 3. The nurses' perception of music's effectiveness on anxiety.

The second question assesses the nurse's awareness or knowledge of music therapy as an intervention for the management of anxiety. Nurses were asked to rank their agreement with the statement: "I am aware of evidence supporting the use of music for the management of anxiety in burn patients." Figure 4 shows the frequency distribution of the level of agreement. Of the 21 nurses only 24% (N= 5) reported that they were "very aware," 62% (N=13) reported that they were "somewhat aware," while 1% (N=2) had "very little" knowledge, and 5% (N=1) was "undecided."

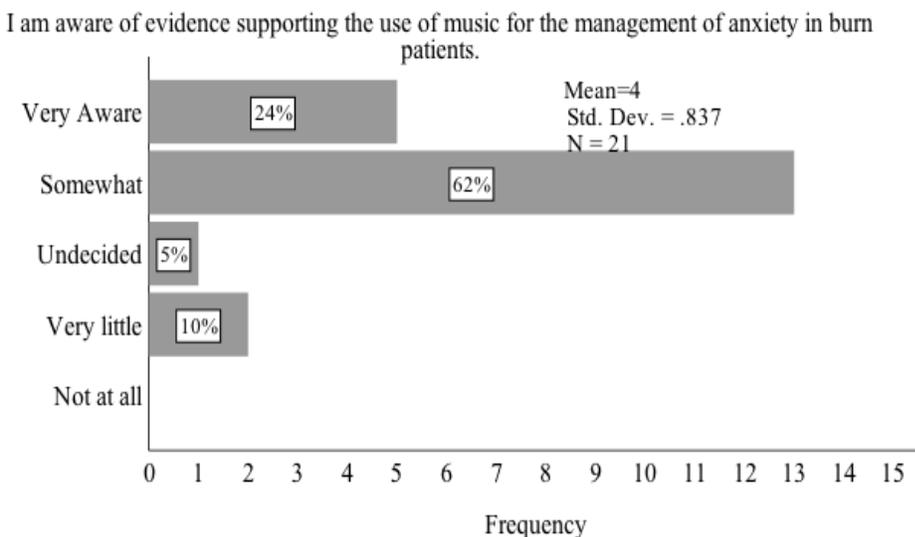


FIGURE 4. Nurses' knowledge regarding evidence-supporting music for anxiety management.

The third question assesses the nurses' current utilization of music in their day-to-day practice prior to this project. Nurses were asked to rank their agreement with the following statement: "I play music for my patients during their dressing changes." Figure 5 (below) shows that 43% (N=9) of the nurses replied that they played music "sometimes," while 29% (N=6) played music "always," 19% (N=4) played music "every once in a while," 5% (N=1) played music "rarely." The remaining 5% (N=1) "never" played any music.

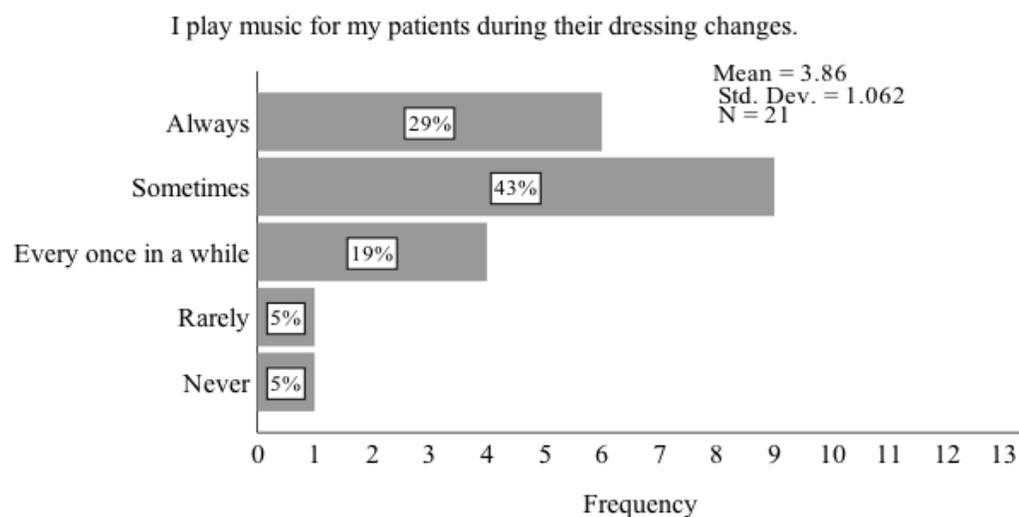


FIGURE 5. Nurses' utilization of music interventions.

The fourth question assessed the potential feasibility of the music intervention program in the burn center. Nurses were asked: "If the supplies are available, music interventions can easily be incorporated into use during routine dressing changes." Remarkably out of the 21 nurse respondents, 90% (N=19) "strongly agreed" with the statement, and 10% (N=2) "somewhat agreed." The results can be seen below in Figure 6.

If the supplies are available, music interventions can easily be incorporated into use during dressing changes.

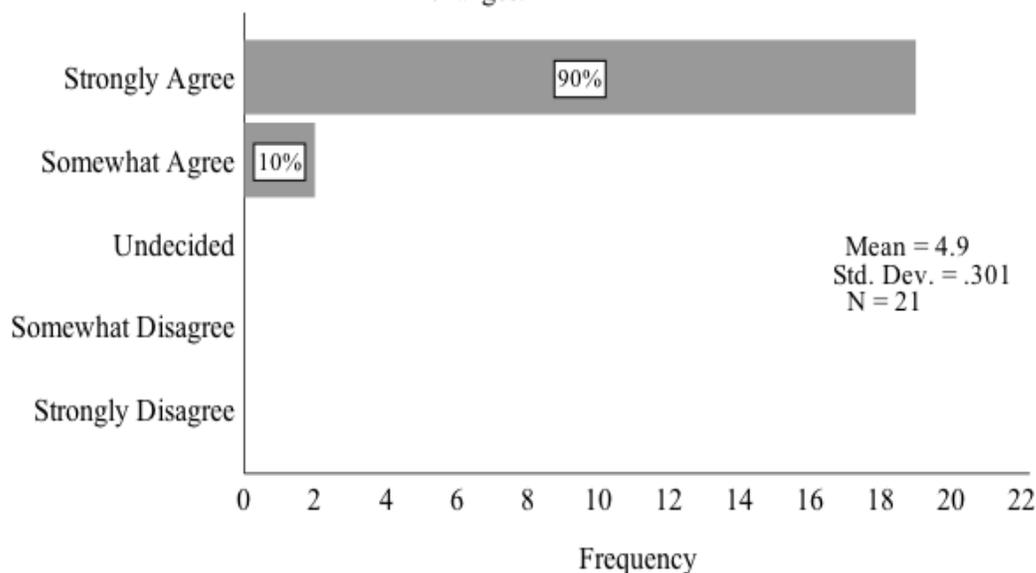


FIGURE 6. Music interventions feasibility into daily practice.

DISCUSSION

Introduction

The purpose of this project was to evaluate the effectiveness of a patient-selected music intervention on anticipated anxiety before routine dressing changes and to assess nurses' perceptions and practice related to the use of music as a therapeutic intervention for the management of anxiety in the unit's burn population at the Arizona Burn Center. This section will discuss the results as they pertain to the study questions, limitations encountered during the implementation phase, and provide recommendations for future implementation on this unit.

Study Question 1

Does an evidence-based non-pharmacological music intervention reduce the anxiety associated with anticipated procedural pain in burn patients at the Arizona Burn Center?

The effects of music intervention on anxiety were examined by evaluating burn patient's pre and post-test BSPAS scores. There was a mean decrease of six points following the music intervention, demonstrating clinically meaningful improvement in patient anxiety; however, the improvement was not statistically significant. This finding is consistent with reports by Fratianne et al. (2001) and Tan et al. (2010), who also observed non-significant reductions in pain and anxiety perception pre-and post-wound debridement after music intervention. A retrospective power analysis was carried out to determine how this study could have been successful. It was determined that this design was underpowered to detect statistically significant improvement. In this study, to reach a power of 0.8, at least 33 patients would have had to be recruited for a two-sided t-test. Regardless, data already exists that support the positive effects of music intervention on the reduction of anxiety in burn patients. Also, studies exploring the effectiveness of music interventions in various settings found that healthcare professionals felt music beneficial as it made medical procedures less stressful (Barrera, Rykov, & Doyle, 2002; Madson & Silverman, 2010; Malone, 1996). Furthermore, this project also focused on music intervention's clinical applicability in the burn center. Music intervention decreased the anticipated anxiety scores in four out of the seven participants, and only two of the participants had an increase in their scores. One participant scored the same. This clinical observation suggests that music intervention was beneficial.

Study Question 2

What are nurses' perceptions relating to the use of music as a therapeutic intervention for the management of patient anxiety during dressing changes at the Arizona Burn Center?

There are 108 core staff nurses working in the Arizona Burn Center. A total of 21 nurses (19%) participated in the nursing portion of this quality improvement project. Overall, these nurses showed different levels of awareness on evidence that supports the use of music for the management of anxiety. Of the 21 participants, only 24% (N= 5) reported that they were “very aware” with the evidence relating to the use of music to manage anxiety, but 62% (N=13) reported that they were “somewhat aware.” This knowledge deficit may be related to the lack of education about complementary therapies in most nursing programs (Halcon, Chlan, Kreitzer, & Leonard, 2003). Surprisingly, even with this small percentage of awareness, 62% (n=14) of the nurse participants felt that music would effectively reduce patients' anxiety during painful procedures. These findings are inconsistent with those reported by Hopper and Cohen (1998), which indicated that knowledge positively influences the perception of complementary therapies. There was a general appreciation demonstrated by the nurses when they witnessed the music intervention on their patients. It is uncertain if exposure to the intervention would improve the nurse's future views on music, but additional education is needed to increase their knowledge base. Increasing research use in nursing is challenging, and strategies such as recruiting nurses as change champions can help influence peers as well as serve as an ongoing resource. According to Davies, Edwards, Ploeg, and Virani (2008), support from nurse champions, along with education sessions and the involvement of multiple stakeholders, are important facilitators in implementing evidence-based practice. Music intervention is also a nonpharmaceutical

intervention that can be implemented independently by nurses. This autonomy may result in an increased sense of control and empowerment for the nurses as they can focus on rebuilding trust with their patients without needing to obtain an order to provide the intervention.

Study Question 3

How is music intervention being utilized during dressing changes?

Nurses at the AZBC have used music intervention sporadically during dressing changes for years, and although not all the staff nurses participated in the survey, the results were positive. The results demonstrated that nurses utilized music quite frequently during their patient's dressing changes. Some 29% (n=6) of the nurses marked in their survey that they "always" played music to their patients during their dressing changes while 43% (n=9) marked that they "sometimes" played music. Nurses reported that the unit lacked the resources to provide patients with music intervention. This finding was confirmed by 90% (n=19) of the nurses expressing that if the equipment were made available to them, their utilization rates would increase. Nurses use radios to play music for their patients, but these devices make it impossible to tailor specific music requests. The nurses felt that being equipped with Bluetooth speakers would allow them to stream music from digital streaming services and allow the patients to select their desired music selection. To translate research into practice, a new policy and procedure that permits music as an option for routine care should be developed, and extra equipment should be purchased.

Project Limitations

Some limitations were noted in this study. The sample size was limited due to patient eligibility and the availability of equipment (iPods). Additionally, during this study, the unit

implemented the use of a new burn dressing that reduced the number of daily dressing changes from twice a day to once a day. Furthermore, due to the range of types of burns and potential interventions, such as surgeries, that would potentially confound the findings, inclusion and exclusion criteria, limited the number of potential participants to a small sample size of $n=7$. This number represents a small portion of the unit. Also, all of the participants were recruited from one burn center, and all of them sustained burns with a TBSA of less than 10%. These issues posed a threat to the external validity (generalizability) of the study. However, this study was designed as a quality improvement project for this unit and, therefore, not meant to be generalizable to other units.

Although different variables such as age, burn size, and depth were considered in this project, some confounding variables were not reported. The number of anxiolytics provided to the participants before and during their dressing varied from patient to patient. Also, the location where the intervention was administered varied, and some patients were not taken to the shower room. Failing to take these variables into consideration results in this study having a low internal validity.

The execution of the intervention phase also encountered some limitations. During the participants' music intervention, several of them were faced with repeated interruptions. Some of the participants had trouble keeping their earbuds from slipping out of their ears. Others had to remove their earbuds to engage in dialogue with the medical team. Three of the participants requested not to use the ear buds at all and opted for a different listening experience altogether. Their music playlist was delivered using a speaker, which allowed the participants to attend to both the music and other aspects of the environment. These interruptions may have impacted the

patients' ability to block external sounds that can heighten anxiety or distract participants from the intervention.

Recommendations for Future Practice

The findings of this quality improvement project demonstrate that although nurses lack knowledge of music and its evidence supporting its use on burn patients, their perception about its effects on anxiety was positive and supported by their daily utilization of music during dressing changes. Further education about the evidence that supports the use of music therapies to relieve anxiety in the burn population is needed. Raising awareness about the effectiveness of music interventions can be achieved by holding education sessions during staff quarterly meetings, observing a music intervention session, displaying education facts on bulletin boards, and by expanding this study further to include intubated or nonverbal patients. In addition, expanding the study to other units in the hospital would also increase the generalizability of the study. To increase the external validity of this study, a larger sample size should be considered.

To support the feasibility and sustainability of the music intervention, the process of creating a music playlist should be modified because it would not be practical in routine practice. To influence the nurses' buy-in, the intervention should not interrupt their daily workflow. An alternative would be to use devices with preloaded playlists in various genres so that the patient may still select what they would like to hear. Another option would be to provide equipment with Wi-Fi capability that would allow the patients or the nurse to stream their music selection from their own devices.

Because psychiatric illness is a well-described risk factor for a burn injury, early collaboration with psychiatric services is beneficial as it could potentially improve patients' outcomes. A psychiatric mental health nurse practitioner dedicated to the burn center would help

with early identification of pre-morbid psychiatric disorders as well as manage in hospital psychological distress.

Dissemination

Project findings will be presented to clinical staff at the quarterly department meetings and sent to the chief medical director of the burn center for review. An abstract of the findings will be made available via request. No publication will be sought out.

Conclusion

In summary, this DNP project addressed the effectiveness of patient-selected music intervention on anticipated anxiety before routine dressing changes and assessed nurses' perception and practice related to the use of music as a therapeutic intervention for the management of anxiety. Music intervention is a safe, nonpharmacological, evidence-based intervention that can be easily utilized to enhance patient care, as well as mitigate potential compassion fatigue and burnout in nurses. This project demonstrated that music interventions were clinically effective in decreasing patient anxiety scores and supported the basic principle of Kolcaba's theory of comfort by promoting a state of ease and contentment in burn patients (Kolcaba, 2003). These findings provide opportunities to further improve the quality of care in the burn population through further evaluation of program implementation.

OTHER INFORMATION

Projected Costs

This intervention can easily be incorporated into routine practice in the Arizona Burn Center. Music is cost-effective because it requires minimal resources. The cost incurred to purchase the disposable earbuds, software to upload the music, a Bluetooth speaker, iPod Nano, and iPod Nano case was roughly \$300. MP3 players on the market can be purchased for approximately \$40. There are also inexpensive waterproof pouches that can be used and are

versatile to fit various devices. The earbuds that were purchased cost \$1 each but can be found online for less if purchased in bulk. The Bluetooth speaker purchased cost \$16 and was waterproof. Streaming services such as Amazon Music, Spotify, and Pandora range from \$10 to \$15 per month. Music can also be streamed from YouTube, and that is free. The software can be installed to facilitate the digital transfer from one device to another, and they range from \$20 to \$50.



APPENDIX A:
THE UNIVERSITY OF ARIZONA INSTITUTIONAL REVIEW BOARD 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: July 22, 2019

Principal Investigator: Erika Rivas

Protocol Number: 1906722264

Protocol Title: Music Interventions for The Burn Population: A Quality improvement project

Determination: Human Subjects Review not Required

Documents Reviewed Concurrently:

Regulatory Determinations/Comments:

- Not Human Subjects Research as defined by 45 CFR 46.102(e): as presented, the activities described above do not meet the definition of research involving human subjects as cited in the regulations issued by the U.S. Department of Health and Human Services which state that "Human subject means a living individual about whom an investigator (whether professional or student) conducting research: (i) Obtains information or biospecimens through intervention or interaction with the individual, and uses, studies, or analyzes the information or biospecimens; or (ii) Obtains, uses, studies, analyzes, or generates identifiable private information or identifiable biospecimens."

The project listed above does not require oversight by the University of Arizona.

If the nature of the project changes, submit a new determination form to the Human Subjects Protection Program (HSPP) for reassessment. Changes include addition of research with children, specimen collection, participant observation, prospective collection of data when the study was previously retrospective in nature, and broadening the scope or nature of the study activity. Please contact the HSPP to consult on whether the proposed changes need further review.

The University of Arizona maintains a Federalwide Assurance with the Office for Human Research Protections (FWA #00004218).

APPENDIX B:
RECRUITMENT FLYER

University of Arizona Doctorate Of Nursing Practice (DNP) Project

Music Intervention for the Burn Population: An Evidence-Based Project

University of Arizona Psychiatric Mental Health Nurse Practitioner Student, Erika Rivas will be conducting an evidence-based project in the month of May 2019 aimed to reduce burn patients anxiety before dressing changes by providing music interventions during their routine dressing changes. Your participation is greatly appreciated. Information will be presented at every morning and evening huddle during the month of May.

Questions or comments about this project may be emailed to erikarivas@email.arizona.edu

APPENDIX C:
BASELINE PATIENT CLINICAL DATA

Baseline Patient Clinical Data Study ID _____

1. Type of Burn injury

Scald Flame Electricity Contact

2. TBSA

3. Burn Depth (degree)

4. Location of Burn

APPENDIX D:
PATIENT SURVEY

Patient Survey Study ID _____

1. Please select the category that includes your age.

- 18-24
- 25-34
- 35-44
- 45-54
- 55-64
- 65 or above

2. Please indicate your gender:

- Male
- Female

3. Ethnic Origin

- Asian
- Black
- Hispanic / Latino
- White
- Native American
- Hawaiian / Pacific Islander

4. Ever been diagnosed with one or more of the following:

- Hypertension
- Diabetes
- Heart Disease
- Asthma
- Cancer
- Depression
- Anxiety
- PTSD
- Bipolar
- Schizophrenia

APPENDIX E:
BURN SPECIFIC PAIN ANXIETY SCALE

Burn Specific Pain Anxiety Scale

Study ID _____

1. I find it impossible to relax when my burns are being treated.

0 1 2 3 4 5 6 7 8 9 10

2. I feel my muscles getting tense when the treatment actually begins.

0 1 2 3 4 5 6 7 8 9 10

3. I am frightened of the pain during and/or after the treatment.

0 1 2 3 4 5 6 7 8 9 10

4. The pain makes me nervous and restless.

0 1 2 3 4 5 6 7 8 9 10

5. I find myself worrying about the possible pain I might have to endure for every medical operation.

0 1 2 3 4 5 6 7 8 9 10

APPENDIX F:
NURSES SURVEY

Nurse Survey 1.....Study ID ____

1. I think that music can **effectively** reduce a burn patient's anxiety during painful procedures.

Strongly disagree 1 2 3 4 5 Strongly agree

2. I am aware of evidence supporting the use of music for the management of anxiety in burn patients.

Strongly disagree 1 2 3 4 5 Strongly agree

3. I play music for my patients during their dressing changes.

Never 1 2 3 4 5 Always

4. If the supplies are available, music interventions can easily be incorporated into use during routine dressing changes.

Strongly disagree 1 2 3 4 5 Strongly agree

APPENDIX G:
PATIENT DISCLOSURE FORM

Disclosure Form for Patients

Introduction

My name is Erika Rivas and I am a graduate student from The University of Arizona College of Nursing. This form will provide information that may affect your decision to participate in this quality improvement project.

Purpose of Project

I am conducting a quality improvement project to evaluate the effectiveness of a music listening intervention on anxiety levels among burn patients.

Why are you being asked to participate?

You are being invited to participate because your burn injury meets the inclusion criteria required for this project and your participation may benefit others as studies have demonstrated many positive effects of music on anxiety and pain relief among burn patients

Description of the project:

If you choose to participate you will be asked to:

1. Complete a demographic questionnaire on admission.
2. Complete a 5-item questionnaire that will be provided before your scheduled dressing change. This questionnaire will be administered on two consecutive days.
3. Select music from an unlimited music library.

This music will be stored on an iPod and will be made available for you to use during your scheduled dressing change.

The information obtained from this project will be used to evaluate an evidence-based non-pharmacological modality and its use on burn patients at the Arizona Burn Center. The goal is to

provide these patients with additional modalities to ease their anxiety with the hopes of increasing patient satisfaction as well as improve the quality of care provided in the burn center.

Are there any risks?

The possible risks or discomforts of this project are minimal. Some of the survey questions asked may be distressing to you as you think about your experiences.

To assure that participants are protected, the Institutional Review Board at The University of Arizona reviewed this quality improvement project.

The survey is anonymous and only summary findings will be shared to the clinical staff in the burn center.

What are the benefits?

Benefits may include improved mood, improved psychological well being and a decrease in pain and anxiety.

Your participation may benefit others as well, as studies have demonstrating many positive effects of music on anxiety and pain relief among burn patients.

Confidentiality

All information obtained about you in this study is strictly confidential. The results of this study may be used in presentations and reports, but you will not be identified.

The study is voluntary

It is OK for you to say NO. You may decide not to participate or stop participating at any time.

By completing the survey, you are consenting (agreeing) to participate.

For any questions, please contact *Erika Rivas @ 602-790-6222 or erikarivas@email.arizona.edu.*

APPENDIX H:
NURSES DISCLOSURE FORM

Disclosure Form for Nurses

Introduction

My name is Erika Rivas and I am a graduate student from The University of Arizona College of Nursing. This form will provide information that may affect your decision to participate in this quality improvement project.

Purpose of Project

I am conducting a quality improvement project to evaluate the effectiveness of a music listening intervention on anxiety levels among burn patients.

Why are you being asked to participate?

You are being invited to participate because your patient was selected to participate in this project. Your input on the intervention may also improve the quality of care provided in the Arizona Burn Center.

Description of the project:

If you choose to participate and your patient is selected to participate, you will be asked to:

1. Complete a four-question survey that will assess your perception of the intervention as well as feasibility in daily practice.

The information obtained from this project will be used to evaluate an evidence-based non-pharmacological modality and its use on burn patients. The goal is to provide patients with additional modalities to ease their anxiety with the hopes of increasing patient satisfaction as well as improve the quality of care provided in the burn center.

Are there any risks?

There are no foreseeable risks associated with participating in this project.

To assure that participants are protected, the Institutional Review Board at The University of Arizona reviewed this quality improvement project.

The survey is anonymous and only summary findings will be shared to the clinical staff in the burn center.

What are the benefits?

A benefit of this project may be an improved psychological well being and a decrease in pain and anxiety in the burn patient.

Your participation may benefit others as well, as input from staff is needed to assess the feasibility of this quality improvement project.

Confidentiality

All information obtained about you in this study is strictly confidential. The results of this study may be used in presentations and reports, but you will not be identified.

The study is voluntary

It is OK for you to say NO. You may decide not to participate or stop participating at any time.

By completing the survey, you are consenting (agreeing) to participate.

For any questions, please contact *Erika Rivas @ 602-790-6222 or erikarivas@email.arizona.edu.*

APPENDIX I:
LITERATURE REVIEW OF PSYCHOLOGICAL OUTCOMES

Literature Review of Psychological Outcomes

First Author/ Title/Year	Purpose	Study Design/ Sample/Settings	Methods	Data Collection	Findings	Level of Evidence
<p>Difede, J., Ptacek, J., Roberts, J., Barocas, D., Rives, W., Apfeldorf, W., & Yurt, R. (2002).</p> <p>Acute stress disorder after burn injury: a predictor of posttraumatic stress disorder?</p>	<p>To determine whether ASD predicted chronic PTSD and whether dissociation is more characteristic of the acute-trauma period than PTSD symptoms.</p>	<p>Design: Longitudinal</p> <p>Sample: n=83</p> <p>Inclusions: English speaking who scored 20 or above on the mini mental status exam, admitted to the burn center</p> <p>Setting: burn center</p>	<p>Structured interviews and self-report measures within 2 weeks of injury and again at least 6 months post burn.</p>	<p>Measures:</p> <ul style="list-style-type: none"> • Intrusive symptoms • Avoidant symptoms • Arousal symptoms • ASD symptoms <p>Instruments:</p> <ul style="list-style-type: none"> • Impact of event scale (IES) • Structured clinical interview for DSM (SCID) • Brief symptom inventory (BSI) • Clinician-Administered PTSD Scale (CAPS) <p>Data analysis:</p> <ul style="list-style-type: none"> • Descriptive statistics to document the frequency and severity of ASD symptoms • logistic regression to predict PTSD classification from a diagnosis of ASD • MANOVAs 	<p>Prevalence:</p> <ul style="list-style-type: none"> • ASD 21% • PTSD 36% at 6 mo. <p>Predictors:</p> <ul style="list-style-type: none"> • ASD and anxiety or depression (distress measures) • Avoidance, arousal and intrusive symptoms 	<p>Level 4</p>

First Author/ Title/Year	Purpose	Study Design/ Sample/Settings	Methods	Data Collection	Findings	Level of Evidence
				across all three subjective measures		
Dyster-Aas, J., Willebrand, M., Wikehult, B., Gerdin, B., & Ekselius, L. (2008). Major depression and posttraumatic stress disorder symptoms following severe burn injury in relation to lifetime psychiatric morbidity.	To assessed lifetime and 12-month preburn prevalence of psychiatric disorders in patients admitted to burn unit and prospectively assess the occurrence of minor and major depression as well as PTSD during the first year after the burn.	Design: prospective, longitudinal Sample: n=73 and n=64 at 12 mo. Inclusion criteria: 18 years of age or older, Swedish speaking, without documented mental retardation or dementia, and had $\geq 5\%$ total body surface area (TBSA) burned or a length of stay (LOS) at the Burn Unit of more than 1 day. Setting: Uppsala Burn Center	Patients were interviewed as soon as their medical condition allowed on average 22 days after the injury and then interviewed at 12 months after the burn.	Measures: • Psychiatric disorders Instruments: • Structured clinical interview for DSM (SCID) Data Analysis: Burn-related variables, age, and sex were evaluated by means of the Mann-Whitney <i>U</i> test and the [chi] test. The independent effect of psychiatric morbidity before the burn injury on 12-month postburn morbidity was analyzed with logistic regression.	(66%) of patients presented with at least one lifetime psychiatric diagnosis • Depression 41% • Alcohol abuse 32% • Simple phobia 16% • Panic disorder 16% 12-month prevalence rates • ASD 9.5% • PTSD 9% • Depression 30% • Alcohol abuse 18% • simple phobia 16% Predictors: • Lifetime affective disorders • Lifetime substance use disorder	Level 4
Giannoni-Pastor, A., Eiroa-Orosa, F. J., Fidel Kinori, S. G., Arguello, J. M., &	To explore the variability on posttraumatic stress disorder (PTSD)	Design: Systematic Review and Meta-analysis	Literature review of studies searching for psychological effects of burns	Measures: • ASD symptomatology • PTSD	Prevalence: • ASD at baseline ranged from 2 to 30%	Level 1

First Author/ Title/Year	Purpose	Study Design/ Sample/Settings	Methods	Data Collection	Findings	Level of Evidence
<p>Casas, M. (2016). Prevalence and Predictors of Posttraumatic Stress Symptomatology Among Burn Survivors: A Systematic Review and Meta-Analysis.</p>	<p>and acute stress disorder (ASD) prevalence and evaluate the specific weight of different variables on PTSD development among adult burn patients.</p>	<p>Sample: 24 trials (n=2312 participants) for systematic Review 19 trials for meta-analysis Inclusions: Measurements obtained using standardized measures, adult burn patients >16 yrs., data at least 1 mo. after burn injury and more than 50% of sample assessed within the same time periods Settings: clinical facilities</p>	<p>from 1970 to 2013.</p>	<p>symptomatology</p> <ul style="list-style-type: none"> • previous mental illnesses <p>Instruments:</p> <ul style="list-style-type: none"> • Anxiety dissociation scale (ADS) • burn concerns questionnaire (BCQ) • Beck depression inventory (BDI) • Burn psychosomatic morbidity scale (BPSM) • Burn specific health scale (BSHS) • Brief symptom inventory (BSI) • Burn specific pain anxiety scale (BSPAS) • Composite international diagnostic interview (CIDI) • Coping with trauma interview (CTI) • Davidson trauma scale (DTS) • Hospital anxiety and depression 	<ul style="list-style-type: none"> • PTSD ranged from 3 to 35% at 1 mo. • PTSD ranged from 2 to 40% between 3 and 6 mo. • PTSD ranged from 9 to 45% in the year post burn • PTSD ranged from 7 to 25% more than 2 years post burn <p>Predictors of PTSD:</p> <ul style="list-style-type: none"> • Life threat perception • Acute intrusive symptoms • Pain with burn injuries 	

First Author/ Title/Year	Purpose	Study Design/ Sample/Settings	Methods	Data Collection	Findings	Level of Evidence
				scale (DADS) <ul style="list-style-type: none"> • Hamilton scale for anxiety (HARS) • Impact of event scale (IES) • PTSD checklist-military (PCL-M) • Penn inventory for posttraumatic stress disorder (PENN) • Stanford acute stress reaction questionnaire (SASQR) • Structured clinical interview for DSM (SCID) 		
McGhee, L. L., Slater, T. M., Garza, T. H., Fowler, M., DeSocio, P. A., & Maani, C. V. (2011) The Relationship of Early Pain Scores and Posttraumatic Stress Disorder in Burned Soldiers	To examine the relationship between early acute pain and severity of PTSD symptoms in soldiers with burn injuries.	Design: Retrospective study cross sectional Sample: n=47 Inclusion: pain score recorded in the ED, undergone screening for PTSD at least 1 month after injury using the PCL-M Setting: military burn center	All soldiers admitted to the burn center are screened for PTSD using the PTSD checklist-military (PCL-M) version; however, only those soldiers who received the PCL-M screening at least 30 days after injury were included in the analysis.	Measures: <ul style="list-style-type: none"> • Pain • PTSD symptomatology Instruments: <ul style="list-style-type: none"> • PTSD checklist Military (PCL-M) Data analysis: <ul style="list-style-type: none"> • Kruskal-Wallis test for nonparametric data sets • Spearman correlation test to determine the relationship 	Prevalence PTSD 27.7% Predictors: Pain Level	Level 4

First Author/ Title/Year	Purpose	Study Design/ Sample/Settings	Methods	Data Collection	Findings	Level of Evidence
				between pain levels and other factors		
McKibben, Bresnick, Wiechman Askay & Fauerbach, 2008 Acute stress disorder and Posttraumatic stress disorder: A prospective study of prevalence, course, and predictors in a sample with major burn injuries.	To investigate the utility of self-report measures in detecting acute stress disorder (ASD) and PTSD, and in tracking and predicting PTSD.	Design: Longitudinal Sample: n=151 and n=71 at 24 month follow up Inclusion criteria: 18yrs and older and met one or more of the American Burn Association criteria for major burn injury Setting: Johns Hopkins Burn Center	Initial measures were administered within 72 hours of admission. Follow-up measures were taken at 1, 6, 12 and 24 mo. post injury.	Measures: <ul style="list-style-type: none"> ASD symptoms both during and after their burn injury PTSD diagnosis General psychological distress Instruments: <ul style="list-style-type: none"> Stanford acute stress reaction questionnaire (SASRQ) Davidson trauma scale (DTS) Brief symptom inventory (BSI) Data Analysis: <ul style="list-style-type: none"> Categorical descriptors were analyzed with (chi) statistics Mann-Whitney <i>U</i> test to determine the predictors logistic regression analyses to data across time frame 	Prevalence: <ul style="list-style-type: none"> ASD 21% PTSD was 35.1% at 1 mo. PTSD 33.3% at 6 mo. PTSD 28.6% at 12mo. PTSD 25.4% at 24 mo. Predictors for PTSD <ul style="list-style-type: none"> Female sex Mental health treatment in the year before the burn A high score on BSI More burn related operations ASD 	Level 4
Palmu, R., Suominen, K., Vuola, J., &	To investigate the prevalence of mental disorders	Design: Prospective longitudinal follow-up study	Baseline interview during hospitalization to	Prevalence of mental disorders after burn	Prevalence: <ul style="list-style-type: none"> ASD 5.4% 	Level 4

First Author/ Title/Year	Purpose	Study Design/ Sample/Settings	Methods	Data Collection	Findings	Level of Evidence
<p>Isometsä, E. (2011).</p> <p>Mental disorders after burn injury: a prospective study</p>	<p>during a 6-month follow-up also the relationship between burn severity (level of exposure) and prevalence of mental disorders after the burn.</p>	<p>Sample: n=107 at acute phase but n=92 at 6mo. follow up</p> <p>Inclusion Criteria: Finnish speaking and >18 yrs. of age</p> <p>Setting: burn center in Finland</p>	<p>diagnose mental disorder.</p> <p>After baseline interview patient filled out questionnaires exploring different psychological symptoms.</p> <p>Same psychiatrist interviewed patients at 6 mo. follow up.</p> <p>At follow up patients also filled out a questionnaire.</p>	<p>Instruments:</p> <ul style="list-style-type: none"> • Structured clinical interview for DSM (SCID) • Impact of event scale (IES) • Beck Depression Inventory (BDI) • Beck Anxiety Inventory (BAI) • Beck Hopelessness Scale (BHS) • Alcohol Use Disorders Identification Test (AUDIT) • Beck Scale for Suicidal Ideation (SSI) <p>Data Analysis:</p> <ul style="list-style-type: none"> • Chi-square test, two-sample <i>t</i>-test, and Mann–Whitney <i>U</i>-test • Binomial and multinomial logistic regression to examine relationship between level of burn severity and mental disorders in follow-up. 	<ul style="list-style-type: none"> • PTSD 2.2% 6-month follow-up 40% <p>Predictors:</p> <ul style="list-style-type: none"> • TBSA had weak correlation with avoidance and intrusive symptoms at 6 mo. 	

First Author/ Title/Year	Purpose	Study Design/ Sample/Settings	Methods	Data Collection	Findings	Level of Evidence
<p>Taal, L., & Faber, A. (1998).</p> <p>Posttraumatic stress and maladjustment among adult burn survivors 1–2 years post burn.</p>	<p>To investigate the prevalence of stress symptomatology in the general burn population.</p>	<p>Design: Longitudinal</p> <p>Sample: n=428</p> <p>Inclusion: patients must have been registered as hospitalized in a general hospital or burn unit and >16 years at the moment of discharge</p> <p>Setting: three specialized burn units in the Netherlands</p>	<p>Data about length of hospitalization was collected from hospital.</p> <p>Questionnaire was mailed to patients who were discharged from the participating hospitals at 14-24 months following burn injury.</p>	<p>Measures:</p> <ul style="list-style-type: none"> • Detect experiences of intrusion and avoidance • Shame and functional problems • Physical problems such as pruritus, hypersensitivity, pain <p>Instruments:</p> <ul style="list-style-type: none"> • Impact of event scale (IES) • Symptom checklist 90 for PTSD (SCL-PTSD) • Burn specific health scale (BSHS-SV) <p>Data Analysis: Structural equation model (LISREL) and Bootstrap</p>	<p>Prevalence:</p> <ul style="list-style-type: none"> • 33% suffered severe PTSD symptoms, mean IES score 19.77 (SD= 17.57) <p>Predictors:</p> <ul style="list-style-type: none"> • Life threat perception • Burn related feelings of intimate shame 	<p>Level 4</p>
<p>Tedstone, J. E., & Tarrier, N. (1997).</p> <p>An investigation of the prevalence of psychological morbidity in burn-injured patients.</p>	<p>To investigate the extent to which some psychological and non-psychological factors are associated with future psychological morbidity in burn-</p>	<p>Design: longitudinal cohort</p> <p>Sample: n=45</p> <p>Inclusion: aged between 18 and 65 years, sustained a burn injury <2</p>	<p>Measures assessed using scales within 2 weeks of sustaining a burn injury.</p> <p>Measures reassessed 12 weeks post burn injury.</p>	<p>Measures:</p> <ul style="list-style-type: none"> • Preexisting psychiatric disorders • Anxiety • Depression • PTSD • Intrusion and 	<p>Prevalence:</p> <ul style="list-style-type: none"> • ASD 2.22%, • PTSD 8.89% • Avoidance or intrusion 40% <p>Predictors:</p> <ul style="list-style-type: none"> • Previous mental illness 	<p>Level 4</p>

First Author/ Title/Year	Purpose	Study Design/ Sample/Settings	Methods	Data Collection	Findings	Level of Evidence
	injured patients.	weeks Setting: two burn units and two outpatients clinics		avoidance Instruments: <ul style="list-style-type: none"> • Hospital anxiety and depression scale (HADS) • Impact of event scale (IES) • Penn inventory for posttraumatic stress disorder (PENN) Data Analysis: Pearson's correlation coefficient (r) for continuous data. Multiple regression analyses to investigate the relationships between these factors and subsequent mental health	<ul style="list-style-type: none"> • No relationship was found with TBSA 	
Van Loey, N., Maas, C., Faber, A., & Taal, L. (2003). Predictors of chronic posttraumatic stress symptoms following burn injury: results of a longitudinal study.	To assess if emotional response to the burn accident, pain-related anxiety, and objective severity stressors are predictive of posttraumatic stress symptoms 1-year post burn.	Design: Prospective Longitudinal cohort design Sample: n=301 Inclusion criteria: length of stay >72h, <70 yrs. old, no psychotic disorder, substance abuse or	Assessment using the IES on week 1, 2, and 3 weeks following their injury and subsequently, every 8 weeks till 12 months post burn. In the first week the patient also	Measure: <ul style="list-style-type: none"> • Assess intrusive and avoidant symptoms • peritraumatic response to overwhelming stimuli • Anxiety related to pain Instruments:	Prevalence: <ul style="list-style-type: none"> • ASD 26% 2-3 weeks post burn • PTSD 15% 1-year post burn Predictors: <ul style="list-style-type: none"> • Pain • Peritraumatic dissociation • Anxiety • TBSA 	Level 4

First Author/ Title/Year	Purpose	Study Design/ Sample/Settings	Methods	Data Collection	Findings	Level of Evidence
		dementia Setting: 6 different burn centers	completed the ADS. In week 2 the patients were also assessed using BSPAS.	<ul style="list-style-type: none"> • Impact of event scale (IES) • Anxiety dissociation scale (ADS) • Burn specific pain and anxiety scale P(BSPAS) Data Analysis: Pearson correlation coefficients between pain-related anxiety and peritraumatic anxiety ($r=.36$) and dissociation symptoms ($r=.41$).	<ul style="list-style-type: none"> • Sex • Length of stay 	

APPENDIX J:
LITERATURE REVIEW OF MUSIC INTERVENTIONS

Literature Review of Music Interventions

First Author/ Title/Year	Purpose	Study Design/ Sample/Settings	Methods	Data Collection	Findings	Level of Evidence
<p>Fratianne, R. B., Prensner, J. D., Huston, M. J., Super, D. M., Yowler, C. J., & Standley, J. M. (2001).</p> <p>The effect of Music-Based Imagery and Musical Alternate Engagement on the Burn Debridement Process</p>	<p>To test the efficacy of music-based imagery and musical alternate engagement in assisting burn patients in managing their pain and anxiety during debridement.</p>	<p>Design: Repeated measure design</p> <p>Sample: n=25 16 males and 9 females Age 7 to 83 (mean, 42.84) 1 to 48% (mean, 9.96%) of TBSA</p> <p>Setting: Inpatient burn Center</p>	<p>Participants were assigned to 1 of 2 groups.</p> <p>Group A received music therapy intervention during their first dressing change and no music therapy on the following day.</p> <p>Group B received no music therapy intervention during their first dressing change and music therapy during their next dressing on the following day.</p> <p>Music intervention before, during and after procedure</p>	<p>Measures:</p> <ul style="list-style-type: none"> • Pulse rate • Self-report of pain • Self-report of anxiety • Behavioral observation <p>Instruments:</p> <ul style="list-style-type: none"> • Wong/Baker Faces Rating scale (WBFRS) • 0-10 Visual analog scale (VAS) • Trippet objective Muscle Relaxation Inventory (TOMRI) <p>Data Analysis:</p> <ul style="list-style-type: none"> • repeated-measures analysis of variance • Post hoc <i>t</i> tests • Categorical variables were analyzed by the [chi]² test. 	<p>Self-report of pain, there was a statistically significant decrease between T1 and T2 with music therapy (P=0.008)</p> <p>Comparing T1 with T4 the self-report of pain was significantly decrease with music therapy (P=0.004)</p> <p>Self report anxiety between T1 and T4 improved but not statistically significant (P=0.88)</p> <p>Observed tension scores between T1 and T2 very close significant (P=0.057) and comparing T1 and T4 revealed improvement (P=0.054)</p>	<p>Level 2</p>
<p>Li, Zhou, & Wang, 2017 Li, J., Zhou, L., &</p>	<p>To determine the effect of music during treatments.</p>	<p>Design: meta-analysis of randomized</p>	<p>Literature review of studies focused on two key concepts;</p>	<p>Measures:</p> <ul style="list-style-type: none"> • Pain intensity • Anxiety 	<p>Pain intensity showed significant heterogeneity</p>	<p>Level 1</p>

First Author/ Title/Year	Purpose	Study Design/ Sample/Settings	Methods	Data Collection	Findings	Level of Evidence
<p>Wang, Y. (2017).</p> <p>The effects of music intervention on burn patients during treatment procedures: a systematic review and meta-analysis of randomized controlled trials.</p>		<p>controlled trials</p> <p>Sample: 17 studies (n= 804 participants)</p> <p>Inclusions:</p> <ul style="list-style-type: none"> • RCTs with burn patients undergoing various procedures. • Intervention must be music before and/or during and/or after procedures vs. control group without music. • Chinese or English language <p>Setting: Burn centers</p>	<p>music interventions and physical activity outcomes from earliest date to 2016.</p>	<ul style="list-style-type: none"> • HR <p>Instruments for pain:</p> <ul style="list-style-type: none"> • Visual analog scale (VAS) • Wong/Baker Faces Rating Scale (WBFRS) • McGill Pain Questionnaire (MGPQ) • The Nursing Assessment of Pain Index (NAPI) • 11-point Likert scales (11-LS) <p>Instruments for anxiety:</p> <ul style="list-style-type: none"> • The Spielberger's State-Trait Anxiety Inventory (STAI) • The Beck Depression Inventory (BDI) • The State-Trait Anxiety Index for Children (STAIC) • Hamilton Anxiety Scale (HAMA) • The Fear Thermometer (FT) 	<p>($I^2 = 81.6\%$, $P < 0.001$) music intervention found to reduce the pain experienced by burn patients during procedures (SMD= -1.26, 95% CI [-1.83, -0.68])</p> <p>Anxiety significant heterogeneity ($I^2 = 87.0\%$, $P < 0.001$) significant reduction in anxiety level (SMD= -1.22, 95% CI [-1.75,-0.69])</p> <p>Heart rate was four studies demonstrated statistical heterogeneity ($I^2 = 88.8\%$, $P < 0.001$). Significantly decreased in the music intervention group (SMD = -0.60, 95% CI [-0.84, -0.36])</p> <p>Blood Pressures Studies did not demonstrate differences between the intervention group and the</p>	

First Author/ Title/Year	Purpose	Study Design/ Sample/Settings	Methods	Data Collection	Findings	Level of Evidence
				<ul style="list-style-type: none"> • Trippett Objective Muscle Relaxation Inventory (TOMRI) • The Muscle Tension Inventory Scale (MTIS) • Hewlett-Packard Component Monitoring System (H-PCMS) • Self-Rating Anxiety Scale (SAS) • Self-Rating Depression Scale (SDS) Data Analysis: <ul style="list-style-type: none"> • Q-test • I² statistic 	control group with regard to blood pressure during treatment procedures (SBP: SMD = -0.37, 95% CI [-1.18, 0.45]; DBP: SMD = -0.24, 95% CI [-0.68, 0.20])	
Najafi Ghezeljeh, T., Mohades Ardebili, F., Rafii, F., & Haghani, H. (2016). The Effects of Music Intervention on Background Pain and Anxiety in Burn Patients: Randomized Controlled Clinical	To investigate the effect of music on the background pain, anxiety, and relaxation levels in burn patients.	Design: RCT pre-post design Sample: n=100 Inclusion criteria: adult patients who 1) had no respiratory injury, 2) after 72 hours of burn injury, 3) had background pain, 4) were able to	Music intervention was offered once a day (20 min) for 3 consecutive days.	Measures: <ul style="list-style-type: none"> • Pain • Anxiety • Relaxation levels • HR • BP Instruments: <ul style="list-style-type: none"> • Visual analogue scales (VAS) Data Analysis: <ul style="list-style-type: none"> • Fisher's exact test • Independent <i>t</i>-test 	There were statistically significant differences between mean scores of pain ($P < .001$), anxiety ($P < .001$), and relaxation ($P < .001$) levels before and after music intervention in experimental group.	Level 2

First Author/ Title/Year	Purpose	Study Design/ Sample/Settings	Methods	Data Collection	Findings	Level of Evidence
Trial.		<p>communicate, and 5) had no hearing impairment</p> <p>Settings: burn center</p>		<ul style="list-style-type: none"> paired <i>t</i>-test 	<p>No significant differences between mean scores of pulse rate ($P = .65$), respiration ($P = .97$), systolic blood pressure ($P = .08$), and diastolic blood pressure ($P = .47$) before and after music intervention.</p>	
<p>Tan, X., Yowler, C. J., Super, D. M., & Fratianna, R. B. (2010).</p> <p>The efficacy of music therapy protocols for decreasing pain, anxiety, and muscle tension levels during burn dressing changes: a prospective randomized crossover trial.</p>	<p>To explore the efficacy of two music therapy protocols on pain, anxiety, and muscle tension levels during dressing changes in burn patients.</p>	<p>Design: Prospective RCT</p> <p>Sample: 29 inpatients (24 males, 5 females), ages 8-71yrs, TBSA ranged from 3-40% with 62.1% having partial-thickness burns.</p> <p>Inclusion Criteria: > 3 days hospitalization, older than 6 years old, able to communicate, no active psychosis or cognitive diagnosis.</p> <p>Setting: Burn intensive care unit</p>	<p>Music played before, during and after procedure</p> <p>Patient's self-reported pain and anxiety levels measured on a VAS scale of 0-11.</p> <p>7 data points collected</p> <ul style="list-style-type: none"> 20 min before being taken to treatment room Immediately after music based intervention (MBI) On reaching treatment room During music alternate engagement (MEA) and burns 	<p>Measures:</p> <ul style="list-style-type: none"> Pain Anxiety Muscle tension levels <p>Instruments:</p> <ul style="list-style-type: none"> Visual analogue scale (VAS) Muscle Tension Inventory Scale (MTIS) <p>Data analysis: Wilcoxon's signed rank test for dependent measures *$P < .025$ (two tailed) $P < 0.05$ (two tailed)</p>	<p>Results:</p> <p>Post MBI (data point 2) Bedside before dressing change</p> <ul style="list-style-type: none"> Pain ($t = .017^*$, $p < .025$) Anxiety ($t = .107$, $p > .05$) Muscle tension ($t = .061$, $p > .05$) <p>During MAE (data point 4) treatment room, during dressing change</p> <ul style="list-style-type: none"> Pain ($t = .001$, $p < .05$) Anxiety ($t = .017^*$, $p < .025$) Muscle tension ($t = .012$, $p < .05$) <p>Post MBI (data point 7) bedside, after dressing change</p>	<p>Level 2</p>

First Author/ Title/Year	Purpose	Study Design/ Sample/Settings	Methods	Data Collection	Findings	Level of Evidence
			being debrided <ul style="list-style-type: none"> • At the end of dressing changes • At bedside after dressing changes • After another MBI was performed at patients bedside 		<ul style="list-style-type: none"> • Pain (t= .014*, p< .025) • Anxiety (t= .046, p< .05) • Muscle tension (t= .015*, p< .025) 	

REFERENCES

- Aaron, L., Patterson, D., Finch, C., Carrougher, G., & Heimbach, D. (2001). The utility of a burn specific measure of pain anxiety to prospectively predict pain and function: A comparative analysis. *Burns*, 27(4), 329-334.
- Allareddy, V., Peek-Asa, C., Yang, J., & Zwerling, C. (2007). Risk factors for rural residential fires. *Journal of Rural Health*, 23(3), 264-269. doi:10.1111/j.1748-0361.2007.00100.x
- Allred, K. D., Byers, J. F., & Sole, M. L. (2010). The effect of music on postoperative pain and anxiety. *Pain Management Nursing*, 11(1), 15-25.
- American Burn Association. (2007). Guidelines for the operation of burn centers. *J Burn Care Res*, 28(1), 134-141. doi:10.1097/BCR.0b013e31802c8861
- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders (DSM-5®)*: American Psychiatric Pub.
- Andrews, C. J., Kimble, R. M., Kempf, M., & Cuttle, L. (2017). Evidence-based injury prediction data for the water temperature and duration of exposure for clinically relevant deep dermal scald injuries. *Wound Repair and Regeneration*, 25(5), 792-804.
- Askay, S. W. & Patterson, D. R. (2008). What are the psychiatric sequelae of burn pain? *Current pain and headache reports*, 12(2), 94-97.
- Association, A. M. T. (2016). Who are music therapist?
- Barrera, M. E., Rykov, M. H., & Doyle, S. L. (2002). The effects of interactive music therapy on hospitalized children with cancer: A pilot study. *Psycho-Oncology: Journal of the Psychological, Social and Behavioral Dimensions of Cancer*, 11(5), 379-388.
- Benjamin, D. A. & Jaco, M. (2018). *Burn Nursing Total Burn Care*: Elsevier Inc. .
- Browne, A. L., Andrews, R., Schug, S. A., & Wood, F. (2011). Persistent pain outcomes and patient satisfaction with pain management after burn injury. *The Clinical Journal of Pain*, 27(2), 136-145.
- Brownson, E. G. & Gibran, N. S. (2017). Evaluation of the burn wound: Management decisions *Total Burn Care*: Elsevier Health Sciences.
- Capek, K. D., Sousse, L. E., Hundeshagen, G., Voigt, C. D., Suman, O. E., Finnerty, C. C., ... Herndon, D. N. (2018). Contemporary burn survival. *Journal of the American College of Surgeons*, 226(4), 453-463.

- Carrougher, G. J., Ptacek, J., Honari, S., Schmidt, A. E., Tininenko, J. R., Gibran, N. S., & Patterson, D. R. (2006). Self-reports of anxiety in burn-injured hospitalized adults during routine wound care. *Journal of Burn Care & Research*, 27(5), 676-681.
- Chlan, L. L., Weinert, C. R., Heiderscheid, A., Tracy, M. F., Skaar, D. J., Guttormson, J. L., & Savik, K. (2013). Effects of patient-directed music intervention on anxiety and sedative exposure in critically ill patients receiving mechanical ventilatory support: A randomized clinical trial. *JAMA*, 309(22), 2335-2344. doi:10.1001/jama.2013.5670
- Davies, B., Edwards, N., Ploeg, J., & Virani, T. (2008). Insights about the process and impact of implementing nursing guidelines on delivery of care in hospitals and community settings. *BMC Health Services Research*, 8(1), 29.
- Difede, J., Ptacek, J., Roberts, J., Barocas, D., Rives, W., Apfeldorf, W., & Yurt, R. (2002). Acute stress disorder after burn injury: A predictor of posttraumatic stress disorder? *Psychosomatic Medicine*, 64(5), 826-834.
- Duke, J., Rea, S., Semmens, J., & Wood, F. (2012). Urban compared with rural and remote burn hospitalisations in Western Australia. *Burns*, 38(4), 591-598.
- Dyster-Aas, J., Willebrand, M., Wikehult, B., Gerdin, B., & Ekselius, L. (2008). Major depression and posttraumatic stress disorder symptoms following severe burn injury in relation to lifetime psychiatric morbidity. *Journal of Trauma and Acute Care Surgery*, 64(5), 1349-1356.
- Fauerbach, J. A., Lawrence, J., Haythornthwaite, J., Richter, D., McGuire, M., Schmidt, C., & Munster, A. (1997). Preburn psychiatric history affects posttrauma morbidity. *Psychosomatics*, 38(4), 374-385.
- Federal Emergency Management Agency. (2007). *Public fire education planning for rural communities: A five-step process*. Retrieved from <https://www.nfpa.org/-/media/Files/Public-Education/By-topic/Rural/FiveStepProcessRural.ashx?la=en>
- Ferguson, S. L. & Voll, K. V. (2004). Burn pain and anxiety: The use of music relaxation during rehabilitation. *Journal of Burn Care and Rehabilitation*, 25(1), 8-14. doi:10.1097/01.bcr.0000105056.74606.9e
- Fratianne, R. B., Prensner, J. D., Huston, M. J., Super, D. M., Yowler, C. J., & Standley, J. M. (2001). The effect of music-based imagery and musical alternate engagement on the burn debridement process. *Journal Burn Care Rehabilitation*, 22(1), 47-53.
- Friedstat, J., Brown, D. A., & Levi, B. (2017). Chemical, electrical, and radiation injuries. *Clinics in Plastic Surgery*, 44(3), 657.

- Giannoni-Pastor, A., Eiroa-Orosa, F. J., Fidel Kinori, S. G., Arguello, J. M., & Casas, M. (2016). Prevalence and predictors of posttraumatic stress symptomatology among burn survivors: A systematic review and meta-analysis. *J Burn Care Res*, 37(1), e79-89. doi:10.1097/BCR.0000000000000226
- Gillen, E., Biley, F., & Allen, D. (2008). Effects of music listening on adult patients' pre-procedural state anxiety in hospital. *International Journal of Evidence-Based Healthcare*, 6(1), 24-49.
- Halcon, L. L., Chlan, L. L., Kreitzer, M. J., & Leonard, B. J. (2003). Complementary therapies and healing practices: Faculty/student beliefs and attitudes and the implications for nursing education. *Journal of Professional Nursing*, 19(6), 387-397. doi:10.1016/s8755-7223(03)00133-9
- Health Resources & Services Administration (HRSA). (2017). *HRSA data warehouse preformatted report*. Retrieved from <https://datawarehouse.hrsa.gov/topics/shortageAreas.aspx>
- Hettiaratchy, S., & Papini, R. (2004). Initial management of a major burn: II--assessment and resuscitation. *BMJ (Clinical Research Ed.)*, 329(7457), 101-103. doi:10.1136/bmj.329.7457.101
- Hopper, I. & Cohen, M. (1998). Complementary therapies and the medical profession: A study of medical students' attitudes. *Alternative Therapies in Health and Medicine*, 4(3), 68-73.
- Hsu, K.-C., Chen, L. F., & Hsieh, P. H. (2016). Effect of music intervention on burn patients' pain and anxiety during dressing changes. *Burns*, 42(8), 1789-1796. doi:https://doi.org/10.1016/j.burns.2016.05.006
- Hung, P., Henning-Smith, E. C., Casey, M. M., Kozhimannil, B. K. (2017). Access to obstetric services in rural counties still declining, with 9 percent losing services, 2004–14. *Health Affairs*, 36(9), 1663-1671. doi:10.1377/hlthaff.2017.0338
- Jennings, E. M., Okine, B. N., Roche, M., & Finn, D. P. (2014). Stress-induced hyperalgesia. *Progress in Neurobiology*, 121, 1-18. doi:10.1016/j.pneurobio.2014.06.003
- Judkins, K. & Clark, L. (2010). Managing the pain of burn wounds. *Wounds UK*, 6(1), 110-118.
- Klein, M. B., Kramer, C. B., Nelson, J., Rivara, F. P., Gibran, N. S., & Concannon, T. (2009). Geographic access to burn center hospitals. *JAMA*, 302(16), 1774-1781. doi:10.1001/jama.2009.1548
- Kolcaba, K. (2003). *Comfort theory and practice: a vision for holistic health care and research*: Springer Publishing Company.

- Kolcaba, K. (2007). The comfort line. Retrieved from www.TheComfortLine.com
- Kornhaber, R. A. & Wilson, A. (2011). Building resilience in burns nurses: A descriptive phenomenological inquiry. *Journal of Burn Care & Research*, 32(4), 481-488.
- Krout, R. E. (2007). Music listening to facilitate relaxation and promote wellness: Integrated aspects of our neurophysiological responses to music. *The Arts in Psychotherapy*, 34(2), 134-141. doi:<http://dx.doi.org/10.1016/j.aip.2006.11.001>
- Lee, O. K., Chung, Y. F., Chan, M. F., & Chan, W. M. (2005). Music and its effect on the physiological responses and anxiety levels of patients receiving mechanical ventilation: a pilot study. *Journal of Clinical Nursing*, 14(5), 609-620. doi:10.1111/j.1365-2702.2004.01103.x
- Li, J., Zhou, L., & Wang, Y. (2017). The effects of music intervention on burn patients during treatment procedures: A systematic review and meta-analysis of randomized controlled trials. *BMC Complementary and Alternative Medicine*, 17(1), 158. doi:10.1186/s12906-017-1669-4
- Low, J. F. A., Meyer, W. J., Willebrand, M., & Thomas, C. R. (2018). Psychiatric disorders associated with burn injury. *Total Burn Care* (5th ed.): Elsevier.
- Madson, A. T. & Silverman, M. J. (2010). The effect of music therapy on relaxation, anxiety, pain perception, and nausea in adult solid organ transplant patients. *Journal of Music Therapy*, 47(3), 220-232.
- Mahendraraj, K., Durgan, D. M., & Chamberlain, R. S. (2016). Acute mental disorders and short and long term morbidity in patients with third degree flame burn: A population-based outcome study of 96,451 patients from the Nationwide Inpatient Sample (NIS) database (2001–2011). *Burns*, 42(8), 1766-1773.
- Malone, A. B. (1996). The effects of live music on the distress of pediatric patients receiving intravenous starts, venipunctures, injections, and heel sticks. *Journal of Music Therapy*, 33(1), 19-33.
- Maricopa Integrated Health System. (2018). Arizona burn center. Retrieved from <https://www.mihs.org/arizona-burn-center/>
- McDermott, K., Weiss, A., & Elixhauser, A. (2006). Burn-related hospital inpatient stays and emergency department visits, 2013: Statistical Brief# 217.
- McGhee, L. L., Slater, T. M., Garza, T. H., Fowler, M., DeSocio, P. A., & Maani, C. V. (2011). The relationship of early pain scores and posttraumatic stress disorder in burned soldiers. *Journal of Burn Care & Research*, 32(1), 46-51.

- McKibben, J. B., Bresnick, M. G., Wiechman Askay, S. A., & Fauerbach, J. A. (2008). Acute stress disorder and posttraumatic stress disorder: A prospective study of prevalence, course, and predictors in a sample with major burn injuries. *Journal of Burn Care & Research*, 29(1), 22-35.
- McKibben, J. B., Ekselius, L., Girasek, D. C., Gould, N. F., Holzer III, C., Rosenberg, M., ... Gielen, A. C. (2009). Epidemiology of burn injuries II: Psychiatric and behavioural perspectives. *International Review of Psychiatry*, 21(6), 512-521.
- Melnyk, B. M. & Fineout-Overholt, E. (2011). *Evidence-based practice in nursing & healthcare: A guide to best practice*: Lippincott Williams & Wilkins.
- Melzack, R. & Wall, P. D. (1988). *The challenge of pain*: Penguin London.
- Meyer III, W. J., Martyn, J. J., Wiechman, S., Thomas, C. R., & Woodson, L. (2018). Management of pain and other discomforts in burned patients *Total Burn Care* (pp. 679-699. e676): Elsevier.
- Moi, A. L., Haugsmyr, E., & Heisterkamp, H. (2016). Long-term study of health and quality of life after burn injury. *Annals of Burns and Fire Disasters*, 29(4), 295-299.
- Motlagh, H. (2010). Impact of event scale-revised. *Journal of Physiotherapy*, 56(3), 203.
- Nagy, S. (1998). A comparison of the effects of patients' pain on nurses working in burns and neonatal intensive care units. *Journal of Advanced Nursing*, 27(2), 335-340.
- Najafi Ghezeljeh, T., Mohades Ardebili, F., Rafii, F., & Haghani, H. (2016). The effects of music intervention on background pain and anxiety in burn patients: Randomized controlled clinical trial. *Journal of Burn Care & Research*, 37(4), 226-234.
- Najafi Ghezeljeh, T., Mohades Ardebili, F., Rafii, F., & Haghani, H. (2017). The effects of patient-preferred music on anticipatory anxiety, post-procedural burn pain and relaxation level. *European Journal of Integrative Medicine*, 9, 141-147.
doi:<https://doi.org/10.1016/j.eujim.2016.12.004>
- National Collaborating Centre for Methods and Tools. (2011). Stetler model of evidence-based practice. Retrieved from <http://www.nccmt.ca/registry/view/eng/83.html>.
- Nightingale, F. (1992). *Notes on nursing: What it is, and what it is not*: Lippincott Williams & Wilkins.
- Nilsson, U., Unosson, M., & Rawal, N. (2005). Stress reduction and analgesia in patients exposed to calming music postoperatively: A randomized controlled trial. *European Journal of Anaesthesiology*, 22(2), 96-102.

- Palmu, R., Suominen, K., Vuola, J., & Isometsä, E. (2011). Mental disorders after burn injury: A prospective study. *Burns*, 37(4), 601-609.
- Parrett, B. M., Pomahac, B., Demling, R. H., & Orgill, D. P. (2006). Fourth-degree burns to the lower extremity with exposed tendon and bone: A ten-year experience. *Journal of Burn Care & Research*, 27(1), 34-39.
- Patterson, D. R., Hoffman, H. G., Weichman, S. A., Jensen, M. P., & Sharar, S. R. (2004). Optimizing control of pain from severe burns: A literature review. *American Journal of Clinical Hypnosis*, 47(1), 43-54.
- Peek-Asa, C., Zwerling, C., & Stallones, L. (2004). Acute traumatic injuries in rural populations. *American Journal of Public Health*, 94(10), 1689-1693.
- Perry, S. W., Cella, D. E., Falkenberg, J., Heidrich, G., & Goodwin, C. (1987). Pain perception in burn patients with stress disorders. *Journal of Pain and Symptom Management*, 2(1), 29-33.
- Pham, T. N., Cancio, L. C., & Gibran, N. S. (2008). American Burn Association practice guidelines burn shock resuscitation. *J Burn Care Res*, 29(1), 257-266.
doi:10.1097/BCR.0b013e31815f3876
- Powers, P. S., Cruse, W. C., & Boyd, F. (2000). Psychiatric status, prevention, and outcome in patients with burns: A prospective study. *The Journal of burn care & rehabilitation*, 21(1), 85-88.
- Rafla, K. & Tredget, E. E. (2011). Infection control in the burn unit. *Burns*, 37(1), 5-15.
doi:<https://doi.org/10.1016/j.burns.2009.06.198>
- Richardson, P. & Mustard, L. (2009). The management of pain in the burns unit. *Burns*, 35(7), 921-936. doi:10.1016/j.burns.2009.03.003
- Robert, R., Blakeney, P., Villarreal, C., & Meyer, W. J., 3rd. (2000). Anxiety: Current practices in assessment and treatment of anxiety of burn patients. *Burns*, 26(6), 549-552.
- Romp, C. R. & Kiehl, E. (2009). Applying the Stetler model of research utilization in staff development: Revitalizing a preceptor program. *Journal for Nurses in Professional Development*, 25(6), 278-284.
- Solowiej, K., Mason, V., & Upton, D. (2009). Review of the relationship between stress and wound healing: Part 1. *Journal of Wound Care*, 18(9), 357-366.
- Stetler, C. B. (2001). Updating the Stetler model of research utilization to facilitate evidence-based practice. *Nursing Outlook*, 49(6), 272-279.

- Suda, M., Morimoto, K., Obata, A., Koizumi, H., & Maki, A. (2008). Emotional responses to music: Towards scientific perspectives on music therapy. *Neuroreport*, *19*(1), 75-78. doi:10.1097/WNR.0b013e3282f3476f
- Taal, L. & Faber, A. (1998). Posttraumatic stress and maladjustment among adult burn survivors 1-2 years postburn. *Burns*, *24*(4), 285-292.
- Taal, L. A. & Faber, A. W. (1997a). The burn specific pain anxiety scale: Introduction of a reliable and valid measure. *Burns*, *23*(2), 147-150. doi:10.1016/S0305-4179(96)00117-9
- Taal, L. A. & Faber, A. W. (1997b). Post-traumatic stress, pain and anxiety in adult burn victims. *Burns*, *23*(7-8), 545-549.
- Tan, X., Yowler, C. J., Super, D. M., & Fratianne, R. B. (2010). The efficacy of music therapy protocols for decreasing pain, anxiety, and muscle tension levels during burn dressing changes: A prospective randomized crossover trial. *Journal of Burn Care & Research*, *31*(4), 590-597. doi:10.1097/BCR.0b013e3181e4d71b
- Tedstone, J. E. & Tarrier, N. (1997). An investigation of the prevalence of psychological morbidity in burn-injured patients. *Burns*, *23*(7-8), 550-554.
- Terry, A. (2012). *Clinical research for the doctor of nursing practice*: Jones & Bartlett Publishers.
- Thombs, B. D., Bresnick, M. G., & Magyar-Russell, G. (2006). Depression in survivors of burn injury: A systematic review. *General Hospital Psychiatry*, *28*(6), 494-502. doi:10.1016/j.genhosppsy.2006.08.010
- U.S. Fire Administration. (2017). *Electronic cigarette fires and explosion in the United States 2009-2016*. Retrieved from https://www.usfa.fema.gov/downloads/pdf/publications/electronic_cigarettes.pdf
- Van Loey, N. E., Maas, C. J., Faber, A. W., & Taal, L. A. (2003). Predictors of chronic posttraumatic stress symptoms following burn injury: Results of a longitudinal study. *Journal of Traumatic Stress*, *16*(4), 361-369. doi:10.1023/a:1024465902416
- Van Loey, N. E., van Son, M. J., van der Heijden, P. G., & Ellis, I. (2008). PTSD in persons with burns: An explorative study examining relationships with attributed responsibility, negative and positive emotional states. *Burns*, *34*(8), 1082-1089.
- Vidal-Trecan, G., Tcherny-Lessenot, S., Grossin, C., Devaux, S., Pages, M., Laguerre, J., & Wassermann, D. (2000). Differences between burns in rural and in urban areas: implications for prevention. *Burns*, *26*(4), 351-358.

Voss, J. A., Good, M., Yates, B., Baun, M. M., Thompson, A., & Hertzog, M. (2004). Sedative music reduces anxiety and pain during chair rest after open-heart surgery. *Pain, 112*(1-2), 197-203.