11-9-2024

Music Therapy to Reduce Anxiety in Patients Undergoing Invasive Procedures: An Educational Module

Alexander Witthöft
Florida International University, awitt019@fiu.edu

Fernando Alfonso
Florida International University, falfonso@fiu.edu

Javier Luces
jluces2230@gmail.com

Music Therapy to Reduce Anxiety in Patients Undergoing Invasive Procedures: An Educational Module

A DNP Project Presented to the Faculty of the
Nicole Wertheim College of Nursing and Health Sciences

Florida International University

In partial fulfillment of the requirements
For the Degree of Doctor of Nursing Practice

By

Alexander Witthöft MSN, BSN, RN, CCRN

Supervised By

Fernando Alfonso DNP, CRNA, APRN

Javier Luces DNP, CRNA, APRN

Approval Acknowledged: Signed by: Dr. Ann B. Miller A986D8685093471..., DNA Program Chair

Date: 11/7/2024

Approval Acknowledged: Signed by: 27267E9FF76F460..., DNP Program Director

Date: 11/8/2024

Abstract

Background: Although surgical practices have evolved significantly, anxiety remains a concern among the adult population during the perioperative period. Anxiety is characterized by emotional discomfort, apprehension, or dread, with autonomic and somatic manifestations that impair functioning. It is essential to recognize that emotional aspects of anxiety are often overlooked by surgical teams, potentially leading to physiological, psychological, and economic consequences. Traditionally, Midazolam is administered to manage preoperative anxiety. While Midazolam effectively ensures hemodynamic stability during the preoperative and intraoperative stages, its short half-life limits its efficacy in alleviating postoperative anxiety. Additionally, numerous studies have conflicting findings regarding the correlation between preoperative Midazolam use and adverse outcomes such as delirium. Recent research underscores the importance of implementing non-pharmacological therapies, such as Music Therapy (MT), during the perioperative period to enhance anxiety management and improve patient outcomes.
Method: This quality improvement project (QI) aimed to assess the impact of MT on preoperative anxiety among adults at a prominent hospital. Eighteen healthcare professionals, including Certified Registered Nurse Anesthetists (CRNAs) and Anesthesiologists, were invited to participate in a survey, and 11 responded, forming the sample size. A pre/post-test design was utilized to measure knowledge and attitudes towards preoperative anxiety management before and after an educational PowerPoint presentation (PPT). Data were collected via anonymous online surveys using Qualtrics. Descriptive statistics summarized demographic features, and paired-sample t-tests compared pre- and post-test scores to assess changes in knowledge and attitudes. The project adhered to ethical guidelines with IRB approval, informed consent, and stringent data security measures.
Results: The educational PPT markedly improved healthcare providers' acceptance and understanding of MT for preoperative anxiety. Pre-test results showed limited awareness, with only 55% (n=6) recognizing the limited postoperative efficacy of Midazolam. Post-intervention, 100% (n=11) accurately understood MT benefits, emphasizing Classical Turkish music's effectiveness, which all participants agreed surpasses Midazolam in reducing anxiety. Notably, willingness to implement MT surged from 27% (n=3) to 64% (n=7) among participants. The significant shift from initial skepticism to favorable acceptance highlights the educational impact on MT integration in clinical settings.
Discussion: The QI demonstrated the effectiveness of an educational PPT on enhancing knowledge and acceptance of MT for managing preoperative anxiety. Despite the limitations of a small sample size and the study's confinement to a single hospital, the findings reveal significant improvements in healthcare providers' readiness to implement MT, indicating a shift towards patient-centered care. Future implications include the potential for integrating MT into routine clinical practice, enhancing professional development, and fostering quality improvement initiatives. The QI underscores the necessity of ongoing research to explore long-term effects and optimize nonpharmacological interventions. Challenges such as participant availability and the reliance on digital educational tools highlight areas for improvement in study design and engagement strategies. The efficacy of Classical Turkish music highlights the need for further research in nonpharmacological anxiety management to improve patient outcomes.

Keywords: Music Therapy, Preoperative Anxiety, Invasive Procedures, Anxiety Reduction

Table of Contents

Introduction

Anxiety can be defined as an unpleasant sensation associated with tension, nervousness, and fear. Patients who undergo surgery can experience anxiety.[1] Perioperative anxiety can be caused by long waiting times before surgery, worrying about how the procedure will turn out, and anticipating pain or death related to the surgery.[1]

Most surgeries involve physiological and emotional distress, leading to anxiety, stress, and depression in patients.[2] Intense preoperative anxiety has been associated with delayed wound healing and increased risk of postoperative complications such as nausea, vomiting, and pain.[1-3]

Although preoperative anxiety and pain can be treated with anxiolytics and analgesics, these pharmacological approaches carry risks and side effects that may result in delayed healing, extended hospital stays, and delirium.[3] Therefore, it is crucial to incorporate nonpharmacological interventions as part of multimodal pain and anxiety management. One notable nonpharmacological intervention is music therapy (MT).[3] MT offers a safe and cost-effective complementary approach alongside standard surgical care. Its goal is to effectively manage and alleviate anxiety, emotional distress, and pain throughout the perioperative period.[3]

Purpose and PICO Question

Anxiety is a common concern among surgical patients, and addressing it is essential for optimizing their perioperative experience. This Quality Improvement (QI) project aims to compare the effectiveness of MT to the traditional pharmacological approach using midazolam administration. Additionally, this QI project corresponds with the broader objective of advancing patient-centered care by identifying evidence-based strategies to alleviate preoperative anxiety and enhance the adult surgical experience.

PICO: How does Music Therapy compare to administering Midazolam in reducing anxiety in

adult patients undergoing invasive procedures?

Population (P): Adult patients undergoing invasive procedures

Intervention (I): Music therapy

Comparison (C): Midazolam administration

Outcome (O): Reducing anxiety

Problem Statement and Identification

Preoperative anxiety significantly impacts patient well-being and surgical outcomes.[4] This anxiety affects their mental well-being and triggers physiological responses, such as hypertension, tachycardia, and increased surgical bleeding, posing challenges during the invasive procedure.[4,5] Additionally, sociodemographic characteristics, psychosocial variables, surgical/anesthetic considerations, and other elements must be considered when addressing preoperative anxiety.[1] Furthermore, individuals experiencing heightened preoperative anxiety might encounter challenges during their recovery. These difficulties can prompt extended hospital stays, requiring additional medical interventions and increasing health-care costs. This multipronged impact highlights the urgency of addressing preoperative anxiety efficaciously. Therefore, alleviating preoperative anxiety in patients undergoing invasive procedures is crucially important, given the physiological outcomes it exacerbates.

Background

Although surgical practices have progressed significantly, anxiety remains a pervasive concern among the adult population during the perioperative period. Anxiety is defined as a feeling of emotional discomfort, worry, or fear, often coexisting with physical and automatic responses that can disrupt ordinary functioning or activities.[6] It is essential to recognize that anxiety is a natural human response to anticipatory unknowns.[6] Unfortunately, surgical teams

typically disregard the emotional portion of this response, potentially underestimating its physiological, psychological, and financial consequences.

Traditionally, midazolam is used to manage preoperative anxiety.[6] However, although it effectively manages hemodynamic stability during the preoperative and intraoperative stages, its short half-life limits its effectiveness in diminishing postoperative anxiety.[6] Furthermore, studies reveal contradictory findings regarding the connection between preoperative midazolam use and adverse outcomes such as delirium and other complications in surgical patients.[6] Considering the current research highlighting the injurious effects of insufficient anxiety management, it is essential to incorporate nonpharmacological interventions, such as MT, perioperatively.[6]

Scope of the Problem

Preoperative anxiety is a universal affliction that significantly impacts an appreciable segment of individuals globally, with prevalence rates ranging from 11% to as high as 80% among adult patients worldwide.[7] This anxiety disproportionately affects women and extends to pediatric patients, impacting them at an occurrence rate between 41.7% to 75.44%.[7]

The economic burden associated with preoperative anxiety reaches beyond individual patients, further exacerbating health-care's monetary concerns. This financial strain stems from myriad issues linked to anxiety, such as elevated rates of surgical complications, extended hospital stays, and increased use of medical resources.[8] Prolonged recovery times and surgical complications can decrease a patient's ability to remain active and can even lead to disability, negatively influencing both personal well-being and community support.[8] Families and caregivers might also have to take time off work to assist, leading to indirect economic effects.

Current efforts to ameliorate preoperative anxiety include administering various anxiolytics, particularly midazolam.[9] Despite its widespread use, its effectiveness is debatable

within the medical community due to concerns about potential side effects.[9] Consequently, ongoing discussions abound concerning whether nonpharmacological approaches alone can adequately manage preoperative anxiety without requiring medication.[9]

Consequences of the Problem

Numerous studies have investigated the correlation between preoperative anxiety and postoperative pain. Health-care providers often overlook the psychological aspects of undergoing surgery. They typically focus more on other aspects of patient care.[2] Preoperative anxiety aggravates postoperative pain, hindering a full recovery and increasing the likelihood of persistent pain and disability.[2] It also yields a lower quality of life, cognitive issues, memory and attention problems, longer hospital stays, higher health-care costs, depression, and greater physical disability.[4] Moreover, severe preoperative anxiety is linked to poor wound healing and postoperative issues like nausea, vomiting, and pain.[9] Uncontrolled postoperative pain in adult patients necessitates increased analgesic usage, resulting in prolonged hospital stays.[9] Health-care providers commonly use midazolam as a preoperative medication to counter these effects due to its frequent usage and demonstrated efficacy. However, evidence indicates that midazolam has a reduced effect on lessening anxiety in the postoperative period, raising concerns about its ability to address such a vital component of patient care.[9] These findings underscore the necessity for comprehensive perioperative anxiety management approaches and interventions to facilitate extended recovery in surgical patients.[4,10] Therefore, evaluating the effects of utilizing nonpharmacological treatment methods, such as MT, in reducing preoperative anxiety could prove indispensable. Such evaluation is essential for understanding MT's potential benefits in lowering anxiety, improving overall well-being, and enhancing surgical outcomes for these

patients.

Knowledge Gaps

Over the years, perioperative anxiety has primarily been managed with pharmacological approaches despite the availability of nonpharmacological interventions. Interventions like MT have been shown to reduce anxiety in adult surgical patients effectively.[1-3,10,11] MT has been shown to be effective, but more research is needed to standardize its use nationwide. Future studies should explore its impact across different surgical stages, with various types of music and lengths of time, to fully understand its benefits. Further investigation is warranted to compare pharmacological interventions, specifically Midazolam alone, versus the combination of pharmacological and nonpharmacological interventions, such as MT, on surgical patient outcomes. Ultimately, this will shed light and provide abundant and similar positive outcomes to this efficacious and cost-effective approach, potentially becoming a standard care protocol.

Proposed Solution

In current practice, in the preoperative setting, Midazolam is commonly used to decrease anxiety before surgical procedures. Although Midazolam effectively ensures hemodynamic stability during the preoperative and intraoperative periods, its short half-life restricts its impact on anxiety in the postoperative period.[3] Furthermore, several studies report conflicting findings on the association between preoperative Midazolam use and delirium, among other serious complications, in patients undergoing invasive procedures, particularly those undergoing open heart surgery.[3,5] Therefore, considering alternative strategies, including nonpharmacological interventions, is crucial for treating anxiety and enhancing patient outcomes. The combination of nonpharmacological and pharmacological approaches effectively addresses perioperative anxiety.[1,2] Moreover, using music as an intervention alongside medication is supported by various research findings.[2]

MT is a safe and cost-effective intervention for reducing preoperative anxiety and promoting relaxation in surgical settings.[2] Additionally, MT activates the parasympathetic nervous system, decreasing sympathetic activity.[1,2] However, the efficacy of MT on perioperative anxiety remains inconclusive, necessitating further research.[2] Nevertheless, MT can potentially improve surgical outcomes, shorten hospital stays, and increase patient satisfaction.[1,2] Additionally, MT stimulates areas in the brain associated with pleasure perception, enhancing emotional well-being.[3] MT can be a complementary intervention, effectively managing emotional distress and pain alongside other treatments in patients undergoing invasive procedures.[3] Studies suggest that MT may reduce sedative requirements during regional anesthesia.[3]

Midazolam, commonly used for anxiety management, is associated with varied outcomes and potential adverse effects.[9] While it is a widely utilized medication for anxiety, given before anesthesia induction, its effectiveness and safety profile are debated.[9] Some clinicians question its overall clinical benefits compared to MT.[4] Therefore, nonpharmacological interventions should be emphasized in healthcare to manage anxiety and promote well-being, especially preoperatively.[1,2] A study investigated the effects of 30 minutes of music listening on preoperative anxiety, cortisol levels, blood pressure, and postoperative anxiety scores. The results revealed no significant differences in these parameters between the intervention and control groups, except for lower postoperative anxiety scores observed in the intervention group.[1] This suggests that by integrating MT into surgical settings, patients experience relaxation and distraction from anxiety, improving their procedure outcome.[3,4]

Summary

Before surgery, patients frequently experience anxiety resulting from factors such as waiting times, procedural uncertainty, and fear of pain or death. This anxiety can lead to

adverse outcomes such as delayed wound healing and worsened postoperative complications. While anxiolytics and analgesics address anxiety and pain, their pharmacological use carries risks, heightening the need for nonpharmacological interventions. MT emerges as a formidable non-drug intervention, offering a safe and cost-effective complement to standard care, aiming to manage anxiety, emotional distress, and pain throughout the perioperative period. The QI project's purpose is to explore MT's impact on perioperative anxiety in adult patients undergoing invasive procedures, contrasting its effectiveness to the traditional pharmacological approach of administering midazolam. Given preoperative anxiety's far-reaching effects, this QI project focuses on the need for viable interventions to enhance patient well-being and procedural outcomes. The background emphasizes the ongoing issue of anxiety during the perioperative period, particularly its emotional features. While Midazolam is traditionally used for preoperative anxiety, its efficacy in alleviating postoperative anxiety is limited by a short half-life and conflicting findings regarding adverse outcomes. The scope of the problem is global, affecting a significant number of adults and leading to higher costs from increased complications and more frequent use of medical resources. Consequences of untreated preoperative anxiety encompass not only persistent pain and disability but also diminished quality of life, cognitive impairment, extended hospitalization, increased healthcare costs, and compromised recovery from anesthesia. A comprehensive perioperative anxiety management, considering diverse factors and potential benefits of nonpharmacological interventions, is of utmost importance. The knowledge gaps underscore the dominance of pharmacological approaches in perioperative anxiety management, with insufficient standardization of nonpharmacological interventions like MT. Further research is deemed necessary to bridge gaps in understanding the influence of MT during various perioperative phases, catering to diverse

invasive procedures. The proposed solution advocates for nonpharmacological and pharmacological interventions, highlighting MT as safe and cost-effective. Although evidence of its effectiveness is not definitive, the potential of MT to improve surgical outcomes, shorten hospital stays, and increase patient satisfaction is recognized. Therefore, it is crucial to prioritize nonpharmacological interventions, especially MT, in healthcare to effectively manage anxiety and enhance overall well-being, particularly in the preoperative setting.

Rationale and Objective

While surgical practices have seen significant advancements, anxiety continues to be a prevalent concern for the adult population in the perioperative period. Anxiety is defined as a state of emotional discomfort, distress, apprehension, or fear, often accompanied by autonomic and somatic manifestations that hinder daily functioning. [6] It is essential to recognize that anxiety is a natural human response to uncertainty. Unfortunately, the emotional aspect of this response is frequently underestimated by surgical teams, who may not fully understand the physiological, psychological, and economic consequences it can entail. Traditionally, Midazolam is administered to manage perioperative anxiety.[6] However, while Midazolam effectively ensures hemodynamic stability during the preoperative and intraoperative phases, its short half-life limits its effectiveness in reducing postoperative anxiety. Furthermore, there are conflicting findings in studies regarding the relationship between preoperative Midazolam use and adverse outcomes like delirium and other complications in patients undergoing invasive procedures.[6] Considering the latest research emphasizing the unfavorable ramifications of ineffective anxiety management, it is important to consider implementing nonpharmacological therapies during the perioperative period.[6] Preoperative anxiety is a widespread concern that significantly affects great portions of the global population, with prevalence rates ranging from

11% to as high as 80% in adult patients worldwide.[7] Particularly notable is its disproportionate impact on women and extending to pediatric patients, affecting them at an incidence rate ranging from 41.7% to 75.44%.[7] The financial liability affiliated with preoperative anxiety extends beyond individual patients, further exacerbating health care's economic factors. This monetary strain stems from various issues related to anxiety-induced complications, including elevated rates of surgical complications, extended hospital stays, and increased use of medical resources.[8] Longer recovery times and complications can also decrease a patient's ability to stay active and, in some cases, lead to disability, impacting both personal well-being and the support they receive from their community.[8] Families and caregivers might be compelled to seek time off their employment to provide care, resulting in indirect economic consequences.

Current efforts to address preoperative anxiety include administering various anxiolytics, particularly Midazolam.[9] Despite its widespread use, the efficacy of Midazolam remains a topic of debate within the medical community due to concerns about potential adverse effects.[9] In current practice, in the preoperative setting, Midazolam is commonly used to decrease anxiety before invasive procedures. Although Midazolam effectively ensures hemodynamic stability during the preoperative and intraoperative periods, its short half-life restricts its impact on postoperative anxiety.[3] Furthermore, several studies report conflicting findings on the association between preoperative Midazolam use and delirium, among other serious complications, in patients undergoing surgical procedures, particularly those undergoing open heart surgery.[3,5] Therefore, considering alternative strategies, including nonpharmacological interventions, is crucial for addressing anxiety and enhancing patient outcomes. The combination of nonpharmacological and pharmacological approaches effectively addresses preoperative anxiety.[1,2] Moreover, the use of music as a supplementary intervention alongside

medication is supported by various research findings.[2] Finally, there are ongoing discussions about whether nonpharmacological approaches alone can adequately manage preoperative anxiety.[9]

MT is a safe and cost-effective intervention for reducing preoperative anxiety and promoting relaxation in surgical settings.[2] Additionally, MT activates the parasympathetic nervous system, reducing sympathetic activity.[1,2] However, the efficacy of MT in preoperative anxiety remains inconclusive, necessitating further research.[2] Nevertheless, MT can potentially improve surgical outcomes, shorten hospital stays, and increase patient satisfaction.[1,2] Additionally, MT stimulates areas in the brain associated with pleasure perception, enhancing emotional well-being.[3] MT can be an effective intervention for managing emotional distress and pain in patients undergoing invasive procedures.[3] Studies suggest that MT may reduce sedative requirements during regional anesthesia.[3]

Midazolam, commonly used for anxiety management, is associated with varied outcomes and potential adverse effects.[9] While it is a widely utilized medication for anxiety, given before anesthesia induction, its effectiveness and safety profile are debated.[9] Some clinicians question its overall clinical benefits compared to MT.[4] Therefore, nonpharmacological interventions should be emphasized in healthcare to manage anxiety and promote well-being, especially preoperatively.[1,2] A study investigated the effects of 30 minutes of music listening on preoperative anxiety, cortisol levels, blood pressure, and postoperative anxiety scores. The results revealed no significant differences in these parameters between the intervention and control groups, except for lower postoperative anxiety scores observed in the intervention group.[1] This suggests that by integrating MT into surgical settings, patients experience relaxation and a diversion from anxiety, improving their procedure outcome.[3,4]

This QI project aims to evaluate the effectiveness of music therapy in reducing preoperative anxiety among patients undergoing invasive procedures and to assess its impact on patient receptiveness, surgical results, and the use of health-care services.

Literature Review

Literature Source Process

A comprehensive search strategy was executed for this investigation, utilizing online journal databases, including PubMed, Medline, CINAHL, EBSCO, ProQuest, and Google Scholar, which delivered all pertinent research articles. The aim was to investigate how MT compares to administering midazolam in reducing preoperative anxiety in patients undergoing invasive procedures.

Search Strategy

Precise search parameters were implemented to identify relevant articles pertinent to the study. These included selecting RCTs, Systematic Reviews, and Meta-Analyses that were fully accessible, peer-reviewed, published between 2017 and 2023, and matched the criteria set forth in the PICO question. Additionally, all abstracts underwent thorough assessment, identifying primary and secondary studies that provide considerable evidence for the effectiveness of MT in reducing anxiety in adult patients undergoing invasive procedures.

Keywords

Multiple searches used Boolean operators such as AND, OR, and NOT. The results from these searches were refined by incorporating the following targeted keywords:

- Music Therapy
- Invasive Procedures

- Midazolam
- Preoperative Anxiety
- Surgical Anxiety
- Anxiety Reduction
- Surgical Patients

After a comprehensive review of the abstracts, full-text versions of all articles related to the search terms were selected. During this process, any duplicate articles were removed.

Inclusion and Exclusion Criteria

Inclusion criteria included Randomized Controlled Trials (RCTs), Systematic Reviews, and Meta-Analyses that offered data on adult patients undergoing invasive procedures, focusing on MT and midazolam as interventions to reduce anxiety, and exploring their impact on patients. Studies that did not meet these criteria were excluded, such as articles involving non-adult populations, those that did not reveal the specified interventions, and studies that did not include patients undergoing invasive procedures. These stipulations ensured that the selected studies addressed the research question comparing the effectiveness of MT and midazolam in reducing anxiety in adult patients undergoing invasive procedures.

Study Characteristics

When examining the data in the literature matrix table, it's important to note that each study included in this analysis was evaluated exhaustively for its excellence and reliability. The literature matrix table consists of 13 articles selected and approved based on their methodology and assessed using the research critique framework the American Nurse Association provided. This structure set a standard for assessing various aspects of the studies, guaranteeing a comprehensive and complex scrutiny of their research design,

methods, and outcomes.

The literature matrix table includes a diverse array of research studies, lending insights into the effectiveness of various interventions aimed at lessening anxiety in patients undergoing invasive procedures. These studies employ varying research designs, including RCTs, Systematic Reviews, and Meta-Analyses. The sample sizes range from relatively small groups to larger ones, portraying thousands of patients undergoing various invasive procedures.

One of the variables investigated in these studies includes the impact of interventions such as MT and pharmacological agents on anxiety levels, postoperative pain, physiological parameters, and stress responses. These studies elucidate factors that contribute to preoperative anxiety, providing a comprehensive appreciation of this phenomenon among patients undergoing invasive procedures. The findings reveal compelling results, with therapeutics like MT consistently demonstrating their excellence in reducing anxiety and pain.

These analyses emphasize the profound influence of preoperative anxiety on overall patient outcomes and highlight the potential of nonpharmacological interventions, such as MT, to alleviate anxiety effectively. Solid evidence—mainly classified as Level 1 and Level 2, following the evidence hierarchy outlined by Dearholt and Dang—backs all the studies' findings.

This research data is useful for health-care professionals and researchers seeking evidence-based methods to manage anxiety in surgical environments. It spotlights the importance of considering alternative approaches to traditional pharmacological interventions. It also underscores the need to explore these methods further to heighten comfort and improve outcomes in patients undergoing invasive procedures.

Literature Appraisal and Literature Matrix

When surveying the literature matrix table data, it's important to know that each study in this analysis underwent a comprehensive analysis of its quality and reliability. The literature matrix table comprises 13 articles selected and approved based on their methodology and assessed using the American Nurses Association's research critique framework. This framework served as a standard for evaluating various aspects of the studies, guaranteeing a thorough and intricate examination of their research design, methods, and outcomes.

The literature matrix table incorporates a diverse array of research studies, yielding insights into the effectiveness of various interventions aimed at minimizing anxiety in patients undergoing invasive procedures. These studies make use of different research designs, including RCTs, Systematic Reviews, and Meta-Analyses. The sample sizes range from relatively small groups to larger ones, representing thousands of patients across a multitude of invasive procedures.

Some of the variables these studies explored include the impact of interventions such as MT and pharmacological agents on anxiety levels, postoperative pain, physiological criterion, and stress responses.

Additionally, these studies elucidate factors that contribute to preoperative anxiety, revealing a comprehensive understanding of this phenomenon among surgical patients. The findings reveal compelling results, with interventions like MT consistently demonstrating their effectiveness in lessening pain and anxiety.

These studies underscore the implications of preoperative anxiety on overall patient outcomes and highlight the potential for nonpharmacological interventions, such as MT, to alleviate anxiety effectively. All study results are supported by convincing levels of evidence—

mainly Level 1 and Level 2—according to the Dearholt and Dang's evidence hierarchy.

This research data is helpful for health-care professionals and researchers seeking evidence-based methods to manage anxiety in innumerable surgical settings. It highlights the essentiality of surveying alternative approaches to traditional pharmacological interventions. Additionally, it emphasizes the need to investigate these approaches further to enhance patient comfort and improve outcomes in those undergoing invasive procedures.

Citation	Design/Method	Sample/Setting	Major Variables Studied and Their Definitions	Measurement And Data Analysis	Findings	Results	Conclusions	Appraisal: Worth to Practice/Level
Prasad et al,[12] 2023	Design: Randomized controlled trial (RCT). Methods: The study compared the effects of binaural tone music, patient choice music, and Midazolam on perioperative anxiety using visual anxiety scores (VAS-A).	Sample: 225 patients ASA grade I and II, aged 18-60, scheduled for spinal anesthesia surgery. Setting: All India Institute of Medical Sciences (AIIMS), Jodhpur.	Independent Variables: Type of intervention (Binaural tone music, Patient choice music, Midazolam). Dependent Variables: Anxiety levels (VAS-A), postoperative pain scores (VAS).	Scales Used: VAS-A for anxiety, VAS for pain. Level of Scale: VAS is a continuous scale from 0 to 10. Data Analysis: Mean, standard deviation, median, interquartile range, one-way ANOVA, post-hoc analysis, chi-square tests.	Anxiety scores were significantly lower in patient choice music and binaural tone music groups compared to Midazolam. Postoperative pain scores were significantly lower in patient-selected music group followed by binaural tone music and Midazolam. Time to rescue analgesia postoperatively was comparable in all groups. Patient satisfaction rates were highest in patient choice music group (96% excellent satisfaction).	Both patient choice music and binaural tone music effectively reduced perioperative anxiety and postoperative pain compared to Midazolam. Patient choice music had the highest satisfaction rates.	Music therapy, including patient choice music and binaural tone music, can be an alternative to pharmacological therapy for anxiety reduction in spinal anesthesia surgery. Binaural tone music did not show superiority over patient choice music in terms of anti-anxiolytic effects.	Level 2 evidence - A randomized controlled trial. The study had no specific strengths and no limitations. There was no reported harm or significant risk associated with the study interventions. Music therapy, specifically patient choice music and binaural tone music, demonstrated feasibility for use in today's clinical practice as noninvasive and cost-effective methods for managing perioperative anxiety during spinal anesthesia surgeries.

Giordano et al,[3] 2023	Design: Two-arm randomized and controlled single-center, parallel-group, pre–post event study. Methods: Compared the effects of preoperative music therapy intervention (MT) with intravenous Midazolam for patients undergoing elective stomatology surgery under general anesthesia. Systolic blood pressure (SBP), diastolic blood pressure (DBP), heart rate (HR), anxiety levels using an anxiety visual analog scale (A-VAS), depth of sedation using the bispectral index (BIS), and stress response via plasma prolactin (PRL), growth hormone (GH), and	Sample: 70 patients with stage I or II micro-invasive oral cancer, undergoing elective surgery under general anesthesia. Setting: Stomatology Unit of the University Hospital of Bari, Italy.	Independent Variables: Preoperative music therapy intervention (MT) vs. intravenous Midazolam. Dependent Variables: Anxiety levels (A-VAS), depth of sedation (BIS), physiological parameters (SBP, DBP, HR), stress response (PRL, GH, cortisol), patient satisfaction (PGIS).	Scales Used: Anxiety visual analog scale (A-VAS), Bispectral index (BIS) monitor, systolic blood pressure (SBP), diastolic blood pressure (DBP), heart rate (HR), plasma prolactin (PRL), growth hormone (GH), cortisol levels, patient global impression of satisfaction (PGIS). Data Analysis: The study employed various statistical analyses, including t-tests, Mann–Whitney tests, Fisher's exact tests, and Shapiro tests, to examine differences between the 2 groups and investigate the clinical impact of the interventions. The study also reported descriptive statistics such as mean, standard deviation, and median for different variables as appropriate.	No statistical differences in stress response indicators (PRL, GH, cortisol) or physiological parameters (SBP, DBP, HR) between the two groups. Significant differences in anxiety levels (A-VAS scores) between the MT group and control group. MT group had a statistically lower BIS score compared to the control group. Higher patient satisfaction rates in the MT group.	Preoperative music therapy effectively reduced anxiety and promoted a state of anxiolysis and sedation comparable to intravenous Midazolam in patients undergoing stomatology surgery. Music therapy also led to a more pronounced and longer-lasting effect on surgery-related anxiety. No significant differences in stress response or physiological parameters were observed between the two groups. Patients in the music therapy group reported higher levels of satisfaction.	Music therapy prior invasive procedures can be an alternative to intravenous Midazolam for inducing relaxation and reducing anxiety in patients undergoing stomatology surgery. Music therapy, when conducted by a certified music therapist, offers a safe and cost-effective option with high patient satisfaction. Further research is needed to explore the potential additive or synergistic effects of combining music therapy with anxiolytic	Level of Evidence: Level 2 - Randomized controlled trial with a substantial sample size. The study's strengths include its randomized controlled design and assessment of multiple outcomes. However, limitations include the relatively small sample size and focus on a specific patient population. No reported harm or significant risk associated with the study interventions. Feasibility of Use in Practice: Music therapy, when conducted by a certified music therapist, demonstrates feasibility as a non-drug intervention for managing perioperative

	cortisol levels were measured.						agents and its cost-effectiveness in the perioperative period.	anxiety in stomatology surgery with high patient satisfaction.
Graff et al,[13] 2019	This study was a randomized controlled trial conducted at a university-based ambulatory surgical center.	The study included 157 subjects in total. Patients who were 18 years of age or older, competent to give informed consent, and scheduled to receive a peripheral nerve block in the preoperative bay were included. Exclusion criteria included significant psychiatric disorders, pregnancy, breastfeeding, coagulopathy, hypersensitivity to Midazolam, and renal impairment. -Patients who scored ♦50 on the State-Trait	Independent Variables: Music group (listening to research-selected music) and Midazolam group (receiving intravenous Midazolam). Dependent Variable: Change in STAI-6 anxiety scores from after to before the placement of the peripheral nerve block.	Anxiety scores were determined using the State-Trait Anxiety Inventory-6 (STAI-6). Patient and provider satisfaction scores were recorded using a 10-point visual analog scale. Communication difficulties were evaluated on a 5-point Likert scale. Statistical analyses were performed using STATA 13 statistical software.	The change in STAI-6 anxiety scores from after to before the procedure was similar in both the music and midazolam groups. Pre-block STAI-6 scores were similar between both groups. Post-block STAI-6 scores were lower in the midazolam group than in the music group. Patient satisfaction was higher in the midazolam group. Physician satisfaction was similar in both groups. Both patients and physicians perceived communication	Music Therapy offered an alternative to intravenous Midazolam prior to single-injection peripheral nerve block procedures. The primary outcome of the change in STAI- 6 anxiety scores did not significantly differ between the 2 groups. Patients in the midazolam group reported higher satisfaction levels and fewer communication difficulties compared to the music group.	Music Therapy is an alternative to intravenous Midazolam for reducing anxiety before single- injection peripheral nerve block procedures. The results should be interpreted cautiously due to several study limitations, and further research should explore the impact of music genre and delivery techniques on patient outcomes.	Level 2 evidence Randomized Controlled Trial, providing strong evidence for clinical decision-making. This study is the first randomized controlled trial (RCT) comparing music vs. Midazolam for anxiety reduction in nerve block procedures. Limitations: Possible underpowering of the study, short music intervention duration, and use of noise-canceling headphones. Non-validated satisfaction scale. No harm was caused during the staudy. Feasibility

		Anxiety Inventory-6 (STAI-6) tool, indicating extreme anxiety, were also excluded. The study was conducted at a university-based ambulatory surgical center.			to be more difficult in the music group than in the midazolam group. Vital signs, including mean arterial pressure and heart rate, showed no significant differences between the two groups.			may depend on patient preferences, headphone availability, and standardization of music delivery.
Abate et al,[7] 2020	The study employed a systematic review and meta-analysis to investigate the global prevalence and determinants of preoperative anxiety among surgical patients. It included cross-sectional studies assessing the prevalence of preoperative anxiety among surgical patients without language restrictions from January 2000 up to January 2020.	The study included 28 articles with 14,652 participants. It incorporated studies conducted globally in various countries, including Brazil, Ethiopia, Holland, India, Pakistan, Iran, Nigeria, Palestine, Saudi Arabia, Spain, Tunisia, the UK, and the USA. The included studies covered different types of surgical	The primary outcome of interest was the prevalence of preoperative anxiety among surgical patients. Determinants of preoperative anxiety included sociodemographic characteristics, previous anesthetic exposure, fear of death or complications, presence of comorbidities, health professional mistakes or malpractice,	The study assessed the prevalence of preoperative anxiety using various scales, although specific scales were not mentioned. Reliability information was not provided in the study. The analysis utilized a random-effects model for the meta-analysis, assessing heterogeneity among the included studies with forest plots, x2 tests, I2 tests, and p-values. Subgroup analyses and meta-regression were employed to investigate substantial heterogeneity.	In the study, a systematic review and meta-analysis were conducted to examine the global prevalence and determinants of preoperative anxiety among surgical patients. The results indicated a high global prevalence of preoperative anxiety, with a pooled prevalence of 48%. Subgroup analyses revealed variations in prevalence by continent and	The study included a total of 28 articles, ranging from 2001 to 2019, with sample sizes ranging from 20 to 1447 participants. These studies were conducted in various countries across different surgical specialties, and all reported the prevalence of preoperative anxiety among surgical	The authors concluded that preoperative anxiety among surgical patients significantly impacts perioperative patient outcomes, particularly in high-risk patients. They emphasized the importance of preoperative anxiety screening, patient education on	The level of evidence for this study is Level 2, as it conducted a systematic review and meta-analysis of cross-sectional studies. Strengths of the study include a large sample size and a comprehensive analysis of preoperative anxiety. Limitations may include the heterogeneity of included studies and variations in anxiety assessment tools. There is no

		specialties, such as cancer, cardiac, obstetrics, and orthopedics.	awareness under anesthesia, disability, inability to recover from anesthesia, and fear of postoperative pain.		types of surgery, with the highest prevalence observed in Africa and Asia. Additionally, the study identified several key determinants of preoperative anxiety, including fear of complications, gender, fear of medical mistakes, fear of awakening during surgery, and fear of postoperative pain, highlighting the complex factors contributing to anxiety in this patient population.	patients. The prevalence varied significantly by continent and type of surgery, with the highest rates in Africa and Asia.	anxiety reduction, awareness about anesthesia and surgery, and postoperative pain management options during preoperative patient evaluation and preparation.	mention of any harm or risks associated with the study.
Kühlmann et al,[14] 2018	This study conducted a systematic review and meta-analysis of randomized controlled trials (RCTs) to evaluate the effects of music interventions on anxiety and pain in	The systematic review included 92 RCTs, involving a total of 7385 patients. These studies investigated the impact of music interventions on anxiety and pain in adults	Independent Variable: Music interventions (live or recorded music) with melody, harmony, and rhythm. Dependent Variables: Anxiety and pain	The study used standardized mean differences (MDs) to quantify the effect of music interventions on anxiety and pain. Anxiety and pain levels were measured using scales such as STAI and VAS, with outcome scores	Music interventions significantly reduced anxiety (MD –0.69) and pain (MD –0.50) compared to control conditions, both with high statistical	The results demonstrate that music interventions, whether offered before, during, or after surgery, significantly reduce anxiety and pain in	The study concludes that music interventions are a valuable approach to mitigating anxiety and pain in surgical patients.	Level of Evidence: Level 1 – This study is a systematic review and meta-analysis of high-quality randomized controlled trials (RCTs), providing robust evidence for the

	adult patients undergoing invasive surgery. The study included RCTs published between January 1, 1980, and October 20, 2016. It involved a comprehensive search of eleven electronic databases and the extraction of results and data from selected studies. Random-effects meta-analysis was used to calculate effect sizes as standardized mean differences (MDs), and heterogeneity was explored through subgroup and metaregression analyses	undergoing various types of invasive surgery. The mean age of the participants was approximately 51.7 years, with a predominance of female patients (57%). The majority of studies used either general or regional anesthesia, and the music interventions were performed in hospital or outpatient clinic settings.	levels measured using various scales, including the State-Trait Anxiety Inventory (STAI) and Visual Analogue Scale (VAS).	corrected for baseline values. Funnel plots were constructed to assess publication bias. Subgroup analyses were conducted based on the timing of music interventions (before, during, or after surgery), type of anesthesia, type of music intervention, and whether patients chose music from a list or freely selected it.	significance {$P < 0.001$}. Subgroup analyses showed that music interventions offered before, during, or after surgery all led to reduced anxiety. Postoperative interventions were particularly effective in reducing pain. Music interventions during general anesthesia significantly reduced pain, while no significant difference in anxiety reduction was observed. Offering multiple music interventions enhanced pain reduction, whereas a single intervention had a larger effect on anxiety. Patients selecting music from a provided list showed larger	adult patients undergoing invasive surgical procedures. The effect on anxiety appeared to be most substantial when the intervention was provided before the operation, while postoperative interventions were particularly effective in reducing pain.	These interventions, regardless of when they are administered in the perioperative period, can lead to clinically relevant reductions in anxiety and pain levels. Given the potential for improving clinical outcomes, quality of life, and reducing healthcare costs, the study suggests that music interventions should be considered for wider implementatio n in surgical practice.	effectiveness of music interventions. The study's strengths include a comprehensive search strategy, a large sample size, and rigorous statistical analyses. It emphasizes the clinical relevance of music interventions by demonstrating clinically meaningful reductions in anxiety and pain. The study acknowledges a moderate to high risk of bias in the included studies, particularly in blinding due to the nature of music interventions. Publication bias may also exist, and there was significant heterogeneity among the included studies. However, these

					beneficial effects on anxiety and pain compared to those who chose their music freely.			limitations do not diminish the overall strength of the evidence. The study does not report any harm or risks associated with music interventions, indicating their safety and potential benefits for surgical patients.
Ugras et al,[15] 2018	Ugras et al conducted a randomized controlled trial (RCT) to investigate the effects of different types of music on preoperative anxiety in adult patients undergoing elective surgery. The study included 180 patients randomly divided into 4 groups: a control group that did not listen to music and 3 experimental groups that	The study sample consisted of patients in the Otorhinolaryngology Department of a public hospital in Istanbul, Turkey, between November 2013 and May 2015. A total of 180 patients were included, and the majority were male (70.6%). The patients' mean age was approximately 35.7 years, and most of them had a diagnosis	Independent Variable: Types of music interventions (natural sounds, Classical Turkish Music, and Classical Western Music) with specific characteristics, including melody, harmony, and rhythm. Dependent Variables: Preoperative anxiety levels measured using the State Anxiety Inventory (STAI-	The study utilized descriptive statistics to present demographic data. Analysis of variance (ANOVA) was used to compare pre- and post-music intervention data. Post hoc Tukey HSD tests were performed for further analysis. Data were evaluated within a 95% confidence interval at a 0.05 Type I error level.	Music interventions significantly reduced preoperative anxiety as measured by the STAI-S, with high statistical significance {$p < 0.001$}. Physiological responses, including SBP, DBP, HR, and cortisol levels, decreased in the music groups and increased in the control group, showing statistically	This study demonstrates that music interventions, including natural sounds, Classical Turkish Music, and Classical Western Music, significantly reduce preoperative anxiety and improve physiological responses in adult patients undergoing elective surgery. Classical	The study concludes that music interventions are a valuable nonpharmacological approach to reducing preoperative anxiety and improving the overall well-being of surgical patients. These interventions can lead to clinically relevant reductions in	Level 2 Evidence – This study is a randomized controlled trial (RCT) with a strong level of evidence. The study provides valuable insights into the impact of music interventions on preoperative anxiety and physiological responses. It utilizes a randomized controlled design, which is considered a

	listened to specific types of music (natural sounds, Classical Turkish Music, and Classical Western Music) for 30 minutes. The State Anxiety Inventory (STAI-S), systolic blood pressure (SBP), diastolic blood pressure (DBP), heart rate (HR), and cortisol levels were measured before and after the music intervention. The data were analyzed using descriptive statistics, ANOVA, and post hoc Tukey HSD tests.	of septum deviation (73.3%). The study was conducted in the surgery waiting room of the hospital.	S) and physiological responses, including systolic blood pressure (SBP), diastolic blood pressure (DBP), heart rate (HR), and serum cortisol levels.		significant differences {$p < 0.001$ for SBP, $p = 0.003$ for DBP, $p = 0.039$ for HR, $p < 0.001$ for cortisol). Subgroup analyses indicated that natural sounds, Classical Turkish Music, and Classical Western Music all contributed to the reduction of SBP, with natural sounds and Classical Turkish Music also decreasing DBP. Classical Turkish music was the only type that significantly reduced HR. Classical Turkish music was identified as the most effective type in reducing preoperative anxiety.	Turkish music, in particular, was the most effective in reducing anxiety and maintaining normal blood pressure, heart rate, and cortisol levels.	anxiety levels and provide a calming effect on physiological responses. The findings emphasize the potential for implementing music interventions in preoperative care to enhance patient comfort and surgical outcomes.	robust methodology. The study has some limitations, including a relatively small sample size and potential biases associated with patient demographics. Additionally, the research focuses on a specific patient population (otorhinolaryngology patients), limiting the generalizability of the findings. The study does not report any harm or risks associated with music interventions, indicating their safety and potential benefits for preoperative anxiety reduction.

Wakana et al,[16] 2022	The study employed a single- blind randomized controlled trial (RCT) design. It investigated the effects of music intervention on preoperative anxiety in adult patients with dental fear undergoing oral surgery or dental treatment under intravenous sedation (IVS). The participants were randomly assigned to either a music group or a non-music group. Heart rate variability (HRV) analysis and Visual Analog Scale (VAS) scores were used to evaluate anxiety levels and autonomic nervous system (ANS) activity before and after the music intervention.	The study included 60 participants aged 18 years or older with dental fear. It was conducted in the Department of Dental Anesthesiology at Hokkaido University Hospital between May 2017 and November 2018. Participants were divided into 2 groups: the music group {n=28} and the non-music group {n=2 }. he study excluded patients with certain medical conditions and medications that could affect anxiety or ANS activity.	Independent Variable: Music intervention (listening to music). Dependent Variables: Preoperative anxiety levels measured using Visual Analog Scale (VAS) scores and physiological responses assessed through heart rate variability (HRV) analysis, including LF/HF ratio, CCVHF, and CVRR.	Anxiety levels were measured using a Visual Analog Scale (VAS) with a 100-mm line, where 0 mm represented no anxiety, and 100 mm represented the highest level of fear. HRV analysis included the LF/HF ratio, CCVHF, and CVRR as indicators of autonomic nervous system (ANS) activity. Statistical analyses involved unpaired Student t-tests, x2 tests, Mann-Whitney U tests, paired Student t-tests, and the Wilcoxon signed- rank test to compare and evaluate various parameters before and after music intervention.	There was a significantly higher increase in heart rate (HR) in the music group compared to the non-music group upon entering the operating room (OR) (5.47 bpm vs. 1.36 bpm; $p < 0.001$}. Both groups exhibited increased LF/HF and CVRR values, indicating increased sympathetic nervous system (SNS) activity and overall ANS activity upon entering the OR. However, changes in CCVHF were not significant. VAS scores for subjective fear increased in both groups, but only the non-music group showed a significant change from baseline (+13.6 mm; $p < 0.001$}.	The study found that music intervention, when compared to a non-music control group, did not significantly reduce preoperative anxiety in patients with dental fear before initiating intravenous sedation (IVS) in the dental outpatient operating room (OR). Both groups experienced increased sympathetic nervous system (SNS) activity and subjective fear levels upon entering the OR.	The study concluded that music intervention did not effectively reduce preoperative anxiety in patients with dental fear undergoing oral surgery or dental treatment with IVS in the dental outpatient OR. It also highlighted the challenges of achieving meaningful anxiety reduction in an unfamiliar and potentially stressful OR environment using music intervention.	Level 2 Evidence – This study is a single-blind randomized controlled trial (RCT) with a moderate level of evidence. The study used a rigorous RCT design, HRV analysis, and VAS scores to assess preoperative anxiety. It also provided insights into the challenges of implementing music intervention in an OR setting. The study had limitations related to the study location and potential interruptions in the OR that could affect the effectiveness of music intervention.

					No hyperventilation or hypoventilation was observed during HRV measurements, and no adverse physical effects of music intervention were noted.			Additionally, the study focused on a specific patient population with dental fear, limiting generalizability. The study did not report any harm or risks associated with music intervention, indicating its safety for patients with dental fear undergoing IVS.
Gökçek et al,[17] 2020	The study employed a randomized, double-blind, prospective research design. It aimed to determine the sedative effects of music in patients undergoing septorhinoplasty under general anesthesia. The music group (group M) consisted of	The study included 120 patients aged 18 to 70 undergoing septorhinoplasty under general anesthesia. It was conducted in a single urban state hospital. Patients with specific conditions or who didn't consent were excluded.	Independent Variable: Music therapy (listening to music during surgery). Dependent Variables: Sedation scores, hemodynamic parameters (heart rate, systolic arterial pressure, diastolic arterial pressure, mean arterial	Sedation scores were recorded using the Riker sedation-agitation scale (RSAS). Postoperative pain severity was assessed with a visual analog scale (VAS). Other parameters were monitored and recorded during surgery. Statistical analysis involved t-tests, correlation analysis, and Fisher's e act test, with $p <$	Sedation scores were significantly better in the music group {$p < 0.001$}. VAS scores for pain were lower in the music group {$p < 0.001$). Patients in the music group higher satisfaction rates{$p < 0.001$}. The incidence of intraoperative awareness was higher in the	Music therapy reduced anxiety, pain, and analgesic consumption in patients undergoing septorhinoplast y under general anesthesia. It also led to higher patient satisfaction rates. However, there was no statistically significant	The study concluded that music therapy is an effective nonpharmacol ogical method to reduce pain and anxiety during septorhinopla sty surgery. It also enhances patient satisfaction. Further research is	Level 2 Evidence – This study is a randomized, double-blind prospective research study. The study employed a rigorous design, assessed various parameters, and showed positive effects of music therapy on pain, anxiety, and

	patients who wore headphones and listened to music during the entire operation, while the control group (group C) did not. Sedation scores, hemodynamic parameters, analgesic consumption, and the occurrence of intraoperative awareness were assessed.		pressure), analgesic consumption, and occurrence of intraoperative awareness.	0.05 indicating significance.	control group, but not statistically significant {p = 0.14).	difference in intraoperative awareness between the music and control groups.	needed to better understand the mechanisms behind these effects.	satisfaction. The study is limited to septorhinoplasty patients, limiting generalizability. It did not evaluate preoperative or postoperative anxiety. The incidence of intraoperative awareness, while higher in the control group, was not statistically significant. The study did not report any harm or risks associated with music therapy, indicating its safety for patients undergoing septorhinoplasty under general anesthesia.

Çelik et al,[18] 2022	The research employed a randomized controlled study design. It included 62 patients, with 31 in the experimental group and 31 in the control group. Patients in the experimental group listened to nonverbal and instrumental music before the procedure, while the control group did not. Various parameters, including anxiety, pain, and vital signs, were measured before and after the procedure.	The study included patients waiting for femoral angiography in the waiting room of a training and research hospital in Izmir. Patients were aged 30 to 70, literate, and without neurologic-psychiatric diseases. Specific inclusion criteria, such as anxiety scores, were applied.	Independent Variable: Music therapy (listening to music before the invasive procedure). Dependent Variables: Anxiety levels, pain levels, and vital signs (systolic and diastolic blood pressures, pulse and respiratory rates).	Anxiety levels were assessed using the State-Trait Anxiety Inventory (STAI-I). Pain levels were evaluated with the Visual Analogue Scale (Pain- VAS). Vital signs were measured before, during, and after the procedure. Statistical analysis involved t-tests and Mann-Whitney U anal sis, with $p < 0.05$ considered significant.	Patients in the experimental group had significantly lower an iet le els {$p = 0.000$) and pain levels ($p = 0.001$} compared to the control group after the procedure. Significant differences were observed in diastolic blood pressure {$p = 0.002$) and pulse wave velocity ($p = 0.002$} in ital signs before and after the procedure. No significant differences were found in systolic blood pressure ($p = 0.082$} and respiration rates {$p = 0.836$} before and after the procedure.	Music therapy was effective in reducing blood pressure, respiration rate, anxiety, pain levels, and the need for sedatives in patients undergoing Coronary Angiography before the invasive procedure. It suggests that music therapy, as a nonpharmacolo gical complementary therapy, can be administered safely by healthcare providers.	The study concluded that music therapy is an effective intervention to reduce anxiety, pain, and the use of sedatives in patients before invasive procedures like Coronary Angiography. It can be considered a valuable addition to nonpharmacol ogical complementar y therapies, with no reported adverse effects or additional costs.	Level 2 Evidence – This study is a randomized controlled study. The study employed a rigorous design, assessed various parameters, and demonstrated the positive effects of music therapy on anxiety, pain, and vital signs. The study was limited to patients undergoing Coronary Angiography and focused on specific musical interventions. Generalizability to other procedures and settings may require further research. The study did not report any harm or risks associated with music therapy.

Casarin et al,[19] 2021	This study utilized a randomized controlled trial design to investigate the impact of music therapy on preoperative anxiety in women undergoing total laparoscopic hysterectomy for benign conditions. Patients were randomized into 2 groups: the Music group, which received a structured music therapy intervention, and the Control group, which received standard perioperative care without music therapy. The study also assessed early postoperative pain at 1, 3, and 6 hours post surgery.	The study included women scheduled for total laparoscopic hysterectomy at Del Ponte Women's and Children's Hospital in Varese, Italy, between March 15, 2020, and September 30, 2020. Women with certain medical conditions and those scheduled for other non-gynecologic procedures were excluded from the study.	Independent Variable: Music therapy (structured music therapy intervention). Dependent Variables: Preoperative anxiety levels, early postoperative pain, and other perioperative parameters.	Preoperative anxiety levels were measured using the State-Trait Anxiety Inventory Y Form (STAI-Y). Postoperative pain was evaluated using the visual analog scale at 1, 3, and 6 hours after surgery. Statistical analysis included chi-square tests, t-tests, and other appropriate methods.	The study reported statistically significant reductions in operative anxiety, pain, systolic blood pressure, and heart rate in patients who received perioperative music intervention.	Music intervention was associated with lower operative anxiety, reduced postoperative pain, lower systolic blood pressure, and lower heart rate compared to standard car.	The authors concluded that music intervention has significant beneficial effects on relieving anxiety, pain, and physiological responses in surgical patients. They also highlighted that music intervention for 30–60 minutes had the largest effect on anxiety and pain reduction.	Level 2 Evidence – This study is a randomized controlled trial. The study employed a rigorous design, assessed preoperative anxiety, and demonstrated the effectiveness of music therapy in reducing anxiety in a specific patient population. The study had limitations such as the absence of a placebo group and a relatively small sample size. There was no harm or risks associated with music therapy.
Lee et al,[20] 2023	Research design: Systematic review and meta-analysis. The study employed a systematic review	The included studies involved a total of 2,280 participants. Characteristics: Adult patients	Independent variable: Music intervention, regardless of genre, duration, frequency, or	Scales used for outcome variables: Various scales were used to measure anxiety and pain. The study used bias-	The study reported statistically significant reductions in operative	Music intervention was associated with lower operative anxiety,	The authors concluded that music intervention has significant beneficial	Level of Evidence: The study is a systematic review and meta-analysis, which typically falls into

	and meta-analysis to evaluate the effects of music intervention on operative anxiety and pain in surgical patients. The review followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 statement guidelines.	{age ♦18 ears} undergoing various surgical procedures, excluding invasive or noninvasive diagnostic procedures. Studies were conducted in various countries, including China or Taiwan, the USA, Turkey or Iran, Brazil, South Korea, Malaysia, Italy, and Israel. Type of setting: Hospital settings for surgical procedures.	timing. Dependent variables: Operative anxiety, pain, physiological parameters (e.g., systolic blood pressure, diastolic blood pressure, and heart rate).	corrected standardized mean difference (Hedges' g) and 95% confidence intervals (CIs) in pairwise meta-analyses to analyze the data.	anxiety, pain, systolic blood pressure, and heart rate in patients who received perioperative music intervention.	reduced postoperative pain, lower systolic blood pressure, and lower heart rate compared to standard care.	effects on relieving anxiety, pain, and physiological responses in surgical patients. They also highlighted that music intervention for 30–60 minutes had the largest effect on anxiety and pain reduction.	Level 1 evidence. The study identified limitations related to substantial heterogeneity of effects, suspected publication bias, and potential inconsistencies in treatment effects. There was no harm caused or specific risks associated with the study.
Padam et al,[21] 2017	This is a randomized control trial conducted at the Department of Physiology and Gastroenterology, Indira Gandhi Medical College, Shimla. It was approved by the Institutional Ethical Committee. The	The study included a total of 199 patients aged 19 to 65 years. There were 3 groups: Vedic group (67 patients), instrumental group (66 patients), and control group	Independent Variable: The type of music intervention (Group I: Vedic chants, Group II: Indian classical instrumental music, Group III: Control group). Dependent Variables: Anxiety levels,	Descriptive statistics such as mean and standard deviation (SD) were used for data analysis. Inferential statistics included paired tests, independent t-tests, and "Chi-square" tests. Statistical software Epi Info version 7.2 was used for data analysis.	The study found that listening to Vedic chants and Indian classical instrumental music resulted in a reduction of anxiety levels. Systolic and diastolic blood pressures decreased in all 3 study	The study concluded that listening to Vedic chants and Indian classical instrumental music before endoscopic procedures reduced anxiety scores and improved	The authors concluded that music therapy, specifically listening to Vedic chants and Indian classical instrumental music, has a clinically meaningful	Level 2 Evidence - This study is a randomized controlled trial. The study's strengths include its unique focus on Vedic chants and instrumental music and the observed benefits in reducing anxiety. A

	study included patients aged 18 years and above undergoing elective outpatient GI endoscopy for the first time. Exclusion criteria were patients with impaired hearing, hemodynamic instability, and patients on antihypertensive and antipsychotic drugs. The patients were randomized into 3 groups. The study participants completed the State-Trait Anxiety Inventory (STAI) pro forma, and biophysiological parameters were recorded.	(66 patients). The baseline physiological parameters recorded in the 3 groups did not show any statistically significant difference.	measured using the State-Trait Anxiety Inventory (STAI). Physiological parameters, including heart rate, blood pressure, and oxygen saturation.		groups, with a statistically significant change observed in the instrumental group. All study groups showed an increase in oxygen saturation levels, with a statistically significant difference in the instrumental group.	physiological parameters in patients. It also mentioned that music therapy posed virtually no risk to patients and could help reduce the need for powerful pharmacologic al agents.	impact on reducing anxiety and improving physiological parameters in patients undergoing endoscopic procedures.	limitation is that it was conducted in a single health institution, and multicentric studies are suggested for validation. The study did not report any harm or risks associated with music therapy.
Celebi et al,[22] 2020	This randomized controlled trial took place between October 15, 2015, and September 15,	Initially, 121 patients were included, but after exclusions, the study was completed with	Independent Variable: Music therapy during colonoscopy (intervention	Data were analyzed using SPSS 15.0. Numerical variables were expressed as mean (standard deviation) and median	Music therapy during colonoscopy reduced pain and anxiety, increased	The study concluded that music therapy can be an effective and safe method	Music therapy, particularly using the Ajam Ashiran	This study can be categorized as Level 2 evidence, as it is a randomized

	2016, in the endoscopy unit of the general surgery clinics of Manisa Celal Bayar University hospital in Turkey. Ethical approval was obtained, and written and verbal informed consent was obtained from all patients.	112 patients divided into 2 groups: an intervention group {n = 56} and a control group (n = 56}. he inclusion criteria included being 18 years or older, volunteering to participate, undergoing colonoscopy for the first time, having no communication or hearing problems, being conscious, having no senile dementia, and not taking anxiolytic mdication.	group received music therapy, while the control group did not). Dependent Variables: Pain levels measured using the Visual Analog Scale (VAS). Comfort levels measured using VAS. Anxiety levels assessed using the Spielberger State-Trait Anxiety Inventory (STAI). Vital signs, including heart rate, respiratory rate, systolic and diastolic blood pressure.	(interquartile range-IQR) values, while categorical variables were presented as numbers and percentages. Statistical tests included Student's t-test, the Mann-Whitney U test, the chi-square test for comparisons between groups, and the Wilcoxon signed-rank test for intra-group comparisons.	comfort, and positively affected vital signs in the intervention group. Anxiety scores decreased in the intervention group but increased in the control group after the procedure.	for reducing pain and anxiety and improving patient comfort during colonoscopy. It also positively affected vital signs.	maqam of Turkish Classical Music, was found to be beneficial in reducing pain and anxiety, increasing comfort, and positively affecting vital signs in patients undergoing colonoscopy. It is a cost-effective, noninvasive, and safe method that could be used as an adjunct to analgesics and sedatives.	controlled trial. The study demonstrated the positive effects of music therapy but had limitations related to its sample size and the choice of music by researchers rather than patients. It also lacked blinding and a second observer. The study did not report any harm or risks associated with music therapy.

Results of Individual Studies

Article 1 – Prasad M, Sethi P, Kumari K, et al.[12] Comparison of Binaural Tone Music vs Patient Choice Music vs Midazolam on Perioperative Anxiety in Patients Posted for Surgery Under Spinal Anaesthesia: A Randomized Control Trial.

Prasad et al conducted an RCT to compare the efficacy of various interventions on perioperative anxiety. The study focused on 225 patients classified as ASA grade I and II, aged 18–60, who were scheduled for surgery under spinal anesthesia at the All India Institute of Medical Sciences (AIIMS) in Jodhpur. Independent variables included binaural tone music, patient-choice music, and midazolam, while dependent variables included anxiety levels measured using anxiety visual analog scores (A-VASs) and postoperative pain scores (PPSs). The data analysis involved mean, standard deviation, median, interquartile range, one-way ANOVA, post-hoc analysis, and chi-square tests.

The findings revealed that patient-choice music and binaural tone music were more effective in reducing anxiety compared to Midazolam, and patient-choice music significantly lowered postoperative pain scores. Importantly, patient satisfaction rates were notably higher in the patient choice music group, with 96% of participants reporting excellent satisfaction.

Consequently, the study concluded that MT, particularly patient-choice music and binaural tone music, could serve as an alternative to pharmacological therapy for anxiety reduction during surgery under spinal anesthesia. Notably, binaural tone music did not demonstrate superiority over patient-choice music regarding anti-anxiolytic effects. The study is an RCT providing Level 2 evidence. No specific strengths or limitations were reported, and no harm or significant risks were associated with the interventions. It highlighted the feasibility of using MT as a noninvasive and cost-effective method for managing perioperative anxiety in surgeries performed under spinal anesthesia, underscoring its potential for broad clinical

application.

Article 2 – Giordano F, Giglio M, Sorrentino I, et al.[3] Effect of Preoperative Music Therapy Versus Intravenous Midazolam on Anxiety, Sedation, and Stress in Stomatology Surgery: A Randomized Controlled Study.

Giordano et al conducted an RCT to compare the effects of preoperative MT with intravenous Midazolam in patients undergoing elective stomatology surgery under general anesthesia. The study included 70 patients with stage I or II micro-invasive oral cancer. The researchers measured various parameters, including systolic blood pressure (SBP), diastolic blood pressure (DBP), heart rate (HR), anxiety levels using an A-VAS, depth of sedation using the bispectral index (BIS), and stress response via plasma prolactin (PRL), growth hormone (GH), and cortisol levels. The results indicated no statistical differences in the 2 groups' stress response indicators PRL, GH, cortisol, or physiological parameters SBP, DBP, HR. However, there were significant differences in anxiety levels between the MT group and the control group, with the MT group having a statistically lower BIS score and higher patient satisfaction rates.

The conclusions drawn from this study suggest that preoperative MT is an effective alternative to intravenous Midazolam in inducing relaxation and reducing anxiety in patients undergoing stomatology surgery. MT also had a more pronounced and longer-lasting effect on surgery-related anxiety. However, no significant differences in stress response or physiological parameters were observed between the 2 groups. The study recommends further research to explore the potential synergistic effects of combining MT with anxiolytic agents and its cost-effectiveness perioperatively. This study's level of evidence is classified as Level 2. The strengths include its randomized controlled design and assessment of multiple outcomes, while limitations include the relatively small sample size and focus on a specific patient population.

No reported harm or significant risk was associated with the study interventions. The feasibility of using MT in practice is demonstrated, mainly when conducted by a certified music therapist, with high patient satisfaction.

Article 3 – Graff V, Cai L, Badiola I, Elkassabany NM.[13]Music versus Midazolam During Preoperative Nerve Block Placements: A Prospective Randomized Controlled Study.

The study by Graff et al was an RCT conducted at a university-based ambulatory surgical center. It included 157 subjects, specifically patients aged 18 or older, competent to give informed consent. All subjects were scheduled to receive a peripheral nerve block preoperatively. Exclusion criteria involved significant psychiatric disorders, pregnancy, breastfeeding, coagulopathy, hypersensitivity to Midazolam, and renal impairment. Patients with high anxiety (score 2' 50 on the State-Trait Anxiety Inventory-6 or STAI-6) were also excluded. The study's independent variables were the music group, which listened to research-selected music, and the midazolam group, which received intravenous midazolam. The primary dependent variable was the change in STAI-6 anxiety scores from before to after the peripheral nerve block placement. Patient and provider satisfaction scores were recorded on a 10-point VAS, and communication difficulties were assessed on a 5-point Likert scale. The study found that the change in STAI-6 anxiety scores was similar in the music and midazolam groups, with no significant differences. Patient satisfaction was higher in the midazolam group, while provider satisfaction remained similar. However, patients and physicians experienced more communication difficulties in the music group than in the midazolam group. Vital signs, including mean arterial pressure (MAP) and HR, showed no significant differences between the 2 groups.

In conclusion, the study demonstrated that MT can serve as an alternative to

intravenous Midazolam for anxiety reduction before placement of a peripheral nerve block. Although the primary outcome of anxiety scores did not significantly differ between the 2 groups, patients in the midazolam group reported higher satisfaction levels and fewer communication difficulties. This study provides Level 2 evidence, being an RCT that strongly supports clinical decision-making. However, it has limitations, including possible underpowering, short MT duration, and the use of non-validated satisfaction scales. No harm was reported during the study, and the feasibility of MT may depend on patient preferences, headphone availability, and standardization of music delivery. Further research is needed to explore the impact of music genre and delivery techniques on patient outcomes.

Article 4 – Abate SM, Chekol YA, Basu B.[7] Global prevalence and determinants of preoperative anxiety among surgical patients: A systematic review and meta-analysis.

Abate et al conducted a Systematic Review and Meta-Analysis to explore the global prevalence and determinants of preoperative anxiety among surgical patients. The complex investigation included 28 individual studies with 14,652 participants, covering diverse countries and surgical specialties. The researchers found a high global prevalence of preoperative anxiety at 48%, with variations across continents and types of surgery, most notably in Africa and Asia. The study identified key determinants of preoperative anxiety, including gender, fear of complications, fear of medical mistakes, fear of awakening during surgery, and fear of postoperative pain, underscoring the large prevalence of anxiety in this patient population. The authors stressed the importance of preoperative anxiety screening, patient education, and enhancing awareness about anesthesia and surgery to improve patient outcomes.

This study provides Level 2 evidence. Its strengths include a substantial sample size and a comprehensive analysis of preoperative anxiety. However, it faces potential limitations due to variations in the assessment tools and heterogeneity among included studies.

Article 5 – Kühlmann AYR, de Rooij A, Kroese LF, et al.[14] Meta-analysis Evaluating Music Interventions for Anxiety and Pain in Surgery.

Kühlmann et al conducted a Systematic Review and Meta-Analysis investigating the impact of MT on anxiety and pain in adult patients undergoing invasive surgery. Their study included 92 RCTs conducted between 1980 and 2016, involving 7385 patients undergoing invasive surgeries. The results revealed that MT significantly reduced anxiety and pain compared to control conditions. The study also conducted subgroup analyses, which indicated that MT offered before, during, or after surgery led to reduced anxiety, with postoperative interventions being particularly effective in reducing pain. Patients selecting music from a provided list showed greater beneficial effects in reducing anxiety and pain compared to those who chose their music freely.

The authors concluded that MT is a valuable approach to reducing anxiety and pain in surgical patients. They emphasized the potential benefits of MT in improving clinical outcomes, enhancing quality of life, and reducing healthcare costs, suggesting widespread implementation in surgical practice. This study provides Level 1 evidence, as it is a Systematic Review and Meta-Analysis of high-quality RCTs, offering strong evidence for the effectiveness of MT in surgical settings. Despite acknowledging limitations, like the risk of bias in blinding and potential publication bias, the study reports no harm or risks associated with MT, emphasizing its safety and patient benefits.

Article 6 – Ugras G, Yzldzrzm G, Yuksel S, et al.[15] The Effect of Different Types of Music on Patients' Preoperative Anxiety: A Randomized Controlled Trial.

Ugras et al conducted an RCT with 180 adult patients undergoing elective surgery to investigate the impact of different types of music on preoperative anxiety. The study included a control group and 3 experimental groups that listened to specific kinds of music -

Natural sounds, Classical Turkish music, and Classical Western music - for 30 minutes. Anxiety levels were assessed using the STAI-6, and physiological responses were also evaluated, measuring SBP, DBP, HR, and cortisol levels. The results showed that MT significantly reduced preoperative anxiety ($p < 0.001$) and positively affected physiological responses. In particular, classical Turkish music was identified as the most effective type of anxiety reduction. This study provides Level 2 evidence, signifying a well-designed RCT. However, it has some limitations, such as a relatively small sample size and potential biases related to patient demographics. Additionally, the research was focused on a specific patient population - otorhinolaryngology patients - which may limit the generalizability of the findings. Nevertheless, the study highlights the potential for implementing MT in the perioperative phase to improve patient comfort and surgical outcomes.

Article 7 – Wakana K, Kimura Y, Nitta Y, Fujisawa T.[16] The Effect of Music on Preoperative Anxiety in an Operating Room: A Single-Blind Randomized Controlled Trial.

In the study by Wakana et al, a single-blind RCT was employed to investigate the effects of music intervention on preoperative anxiety in adult patients with dental fear undergoing oral surgery or dental treatment under intravenous sedation (IVS). The study included 60 participants aged 18 years or older with dental fear conducted in the Department of Dental Anesthesiology at Hokkaido University Hospital. Participants were randomly assigned to either a music group or a non-music group. VAS scores were used to assess anxiety levels, and autonomic nervous system (ANS) activity was evaluated through heart rate variability (HRV) analysis, including LF/HF ratio, CCVHF, and CVRR. The study revealed that MT did not notably reduce preoperative anxiety in patients with dental fear before initiating IVS in the dental outpatient operating room (OR). Both groups displayed elevated activity in the sympathetic nervous system (SNS) and subjective fear

levels upon entering the OR.

The study's findings concluded that MT might not be an effective strategy for reducing preoperative anxiety in patients with dental fear undergoing oral surgery or dental treatment with IVS in the dental outpatient OR. It also underscored the difficulties of implementing MT in an unfamiliar and potentially stressful OR environment. This study is classified as Level 2 evidence, representing a single-blind RCT. It yields valuable insights into the limitations of using MT in the context of patients with dental fear and IVS, focusing on the OR setting. The study did not reveal any harm or risks associated with MT, suggesting its safety for patients with dental fear undergoing IVS.

Article 8 – Gökçek E, Kaydu A.[17] The Effects of Music Therapy in Patients Undergoing Septorhinoplasty Surgery Under General Anesthesia.

Gökçek et al performed a study employing a randomized, double-blind, prospective research design to investigate the tranquilizing effects of music in patients undergoing septorhinoplasty under general anesthesia. The study included 120 patients aged 18 to 70 in a single urban state hospital. One group of patients listened to music from headphones throughout the entire operation, while the control group did not. Various parameters were evaluated, including sedation scores, hemodynamic parameters (HR, SBP, DBP, and MAP), analgesic consumption, and the frequency of intraoperative awareness.

The results of the study demonstrated that MT had significant positive effects. Sedation scores were better in the music group, and patients in this group reported lower postoperative pain severity, as indicated by VAS scores. Additionally, patients in the music group expressed higher satisfaction rates. Although the incidence of intraoperative awareness was higher in the control group, this difference was not statistically significant. The study concluded that MT is an effective nonpharmacological approach to reduce pain and anxiety

during septorhinoplasty surgery while enhancing patient satisfaction. However, further research is needed to understand the mechanisms behind these effects better. This study is classified as Level 2 evidence, showcasing its complex methodology in a specific surgical context. While the study is limited to septorhinoplasty patients and did not evaluate preoperative or postoperative anxiety, it did not report any harm or risks associated with MT, suggesting its safety for patients undergoing this procedure under general anesthesia.

Article 9 – Oyur Çelik G, Güzelçiçek A, Çelik S.[18] The Effects of Music Therapy on Patients With Coronary Artery Disease Before the Invasive Procedure: A Randomized Controlled Study.

Çelik et al conducted an RCT to investigate the effects of MT on patients undergoing Coronary Angiography. The study included 62 patients, with 31 in the experimental group who listened to nonverbal and instrumental music before the procedure and 31 in the control group who did not receive this intervention. The study took place in the waiting room of a training and research hospital in Izmir, Turkey, and included patients aged 30 to 70 without neurologic-psychiatric diseases. Various parameters, including anxiety levels, pain levels, and vital signs (VS), were measured prior to and following the procedure.

The study's results revealed that MT was highly effective in reducing anxiety and pain levels in patients undergoing coronary angiography. Patients in the experimental group had considerably lower anxiety and pain levels compared to the control group after the procedure. Additionally, significant differences were evident in DBP and pulse wave velocity in VS before and after the procedure, indicating a positive impact on these parameters. MT demonstrated its potential as a nonpharmacological complementary therapy, with no reported adverse effects or additional costs.

This study is classified as Level 2 evidence, underscoring its complex design and

ability to provide valuable insights into the benefits of MT for patients before invasive procedures like Coronary Angiography. While the study focused on specific musical interventions and the Coronary Angiography setting, further research may be needed to assess its applicability to other procedures and settings. No harm or risks associated with MT were reported in the study, highlighting its safety for patients.

Article 10 – Casarin J, Cromi A, Sgobbi B, et al.[19] Music Therapy for Preoperative Anxiety Reduction in Women Undergoing Total Laparoscopic Hysterectomy: A Randomized Controlled Trial.

Casarin et al conducted an RCT to investigate the impact of MT on preoperative anxiety in women undergoing total laparoscopic hysterectomy for benign conditions. The study occurred at Del Ponte Women's and Children's Hospital in Varese, Italy, and included women scheduled for this specific surgical procedure. Patients were divided into 2 groups: the Music group, which received structured music therapy, and the Control group, which received standard perioperative care without music therapy. The study measured preoperative anxiety levels using the State-Trait Anxiety Inventory Y Form (STAI-Y) and evaluated early postoperative pain at 1, 3, and 6 hours post-surgery using the VAS.

The study's results indicated that MT had a significant positive impact on the patients. MT reduced preoperative anxiety, decreased postoperative pain, and lowered SBP and HR when compared to standard care. The authors concluded that MT, particularly when provided for 30-60 minutes, had the most substantial effect on anxiety and pain reduction in surgical patients. This study is categorized as Level 2 evidence, demonstrating the effectiveness of MT in reducing anxiety and pain in a specific patient population undergoing total laparoscopic hysterectomy. Despite some of the study's limitations, such as the absence of a placebo group and a relatively small sample size, no harm or risks associated with MT were reported.

Article 11 – Lee HY, Nam ES, Chai GJ, Kim DM.[20] Benefits of Music Intervention on Anxiety, Pain, and Physiologic Response in Adults Undergoing Surgery: A Systematic Review and Meta-Analysis.

Lee et al conducted a systematic review and meta-analysis to assess the impact of MT on preoperative anxiety and pain in surgical patients. This systematic review included studies with a total of 2,280 participants, consisting of adult patients undergoing various surgical procedures in hospital settings in different countries. The independent variable was MT, without specifying genre, duration, frequency, or timing, while the dependent variables encompassed preoperative anxiety, pain, and physiological parameters such as SBP, DBP, and HR. Various scales were utilized to measure anxiety and pain. All data were analyzed using standardized mean difference (Hedges' g) and 95% confidence intervals in pairwise meta-analyses.

The findings of the study revealed statistically significant reductions in operative anxiety, pain, SBP, and HR among patients who received perioperative MT, which led to the conclusion that MT has substantial positive effects in alleviating anxiety, pain, and physiological responses in surgical patients. The authors also noted that MT with a duration of 30-60 minutes had the most significant impact on reducing anxiety and pain. This study can be categorized as Level 1 evidence. Although the study recognized limitations, such as varied results, possible publication bias, and inconsistent treatment effects, it reported no harm or specific risks.

Article 12 – Padam A, Sharma N, Sastri OSKS, Mahajan S, Sharma R, Sharma D.[21] Effect of Listening to Vedic Chants and Indian Classical Instrumental Music on Patients Undergoing Upper Gastrointestinal Endoscopy: A Randomized Control Trial.

Padam et al conducted an RCT at the Department of Physiology and Gastroenterology, Indira Gandhi Medical College, Shimla, involving patients aged 18 years

and above undergoing elective outpatient gastrointestinal endoscopy for the first time. Exclusion criteria included impaired hearing, hemodynamic instability, and the use of antihypertensive and antipsychotic drugs. The participants were divided into 3 groups: the Vedic chants group (67 patients), the Indian Classical instrumental group (66 patients), and the control group (66 patients). The study utilized the STAI to measure anxiety levels and recorded physiological parameters, including HR, BP, and oxygen saturation. The findings of the study indicated that listening to Vedic chants and Indian Classical instrumental music led to a reduction in anxiety levels among patients. While all 3 groups showed decreased SBP and DBP, the instrumental group displayed a statistically significant change. Additionally, all groups exhibited increased oxygen saturation levels, with a substantial difference in the instrumental group. The study concluded that MT, particularly through listening to Vedic chants and Indian classical instrumental music, effectively reduced anxiety scores and improved physiological parameters in patients undergoing endoscopic procedures. It also emphasized that MT posed minimal risk to patients and could reduce the need for pharmacological agents. This study can be categorized as Level 2 evidence, as it is an RCT with a unique focus on listening to Vedic chants and instrumental music, demonstrating their effectiveness in reducing anxiety. However, the study was carried out in just 1 health institution. It is recommended that multicentric studies be conducted for further validation. The study did not report any harm or risks associated with MT.

Article 13 – Celebi D, Yzlmaz E, Sahin ST, Baydur H.[22] The Effect of Music Therapy During Colonoscopy on Pain, Anxiety, and Patient Comfort: A Randomized Controlled Trial.

Celebi et al conducted an RCT in the endoscopy unit of the general surgery clinic of Manisa Celal Bayar University Hospital in Turkey. The study initially included 121 patients,

but after exclusions, it was completed with 112 patients divided into 2 groups: an intervention group (n = 56) and a control group (n = 56). The inclusion criteria required patients to be 18 years or older, undergoing colonoscopy for the first time, having no communication or hearing problems, being conscious, having no senile dementia, and not taking anxiolytic medication.

The study introduced MT during colonoscopy for the intervention group only. Pain levels and comfort levels were measured using the VAS. Anxiety levels were evaluated using the STAI. VS, including HR, respiratory rate (RR), and SBP, were monitored. The results indicated that MT during colonoscopy reduced pain and anxiety, increased comfort, and positively impacted the intervention group's VS. After the procedure, anxiety scores decreased in the intervention group but increased in the control group. The study concluded that MT, particularly using the Ajam Ashiran maqam of Turkish Classical music, can effectively and safely reduce pain and anxiety and improve patient comfort during colonoscopy. It also positively affected VS. This study can be categorized as Level 2 evidence. While the study demonstrated the positive effects of MT, it had limitations related to its sample size and the choice of music by researchers rather than patients. However, the study did not report any harm or risks associated with MT.

Synthesis of the Literature

Exploring MT as a therapeutic intervention for reducing anxiety in diverse health-care settings has consistently delivered positive outcomes. Myriad studies have demonstrated that MT is not only effective in managing anxiety among patients enduring various medical and surgical procedures, but it also enhances overall patient well-being. MT's success is not universal, however. It depends considerably on tailoring it to meet each patient's particular psychological

and physiological needs. This customization necessitates examining the specific health-care setting—whether it's a surgical ward, a chemotherapy session, or a long-term care facility—as well as the patient's personal health history and emotional condition.

When comparing MT's outcomes with other anxiety-reducing interventions, it becomes evident that the applied methodologies and the features of the patient populations studied serve a critical role in determining MT's efficacy. For example, a patient's age, medical condition, and previous exposure to therapies can influence how they respond to music therapy.

Extensive analysis also suggests that the timing and type of music and the duration of therapy sessions require heedful consideration to maximize therapeutic benefits. Involving patients in selecting music or in the ideation of musical elements can further personalize their experience, thereby amplifying the therapy's effectiveness.

Essentially, for MT to truly be successful, a patient-centered approach must play an essential role in the execution of the intervention. This approach not only involves customizing the therapy to individual needs but also consistently evaluating and modifying the intervention based on patient feedback and clinical outcomes. By concentrating on individualized treatments, medical practitioners can optimize MT's potential to function as a powerful tool in reducing patient anxiety and improving treatment experiences.

Effects of Music on Reducing Anxiety

Based on the comprehensive analysis of the 13 articles, it is evident that MT carries considerable potential in reducing anxiety levels among patients undergoing a broad range of surgical and medical procedures. The findings consistently accentuate MT's ability to reduce anxiety, often comparing favorably to pharmacological interventions like Midazolam. In fact, this therapeutic approach has demonstrated its merit across myriad surgical settings, ranging from

spinal anesthesia and stomatology surgery to procedures such as colonoscopy and laparoscopic hysterectomy. These studies unfailingly emphasize the broad positive impact of MT on operative anxiety and pain. While the specific musical genres and intervention durations vary among these studies, the overarching agreement suggests that MT can profoundly augment patient comfort and well-being while mitigating preoperative anxiety, thus reiterating its potential as a valuable and safe complementary approach to improving patient outcomes.

Comparative Analysis of Music Therapy Interventions

Comparing these studies with similar outcomes and modalities in equivalent settings while allowing for their methodologies reveals a different perspective on MT's effectiveness in lessening anxiety in health-care settings. MT's unvarying success across multiple studies underscores its potential as a reliable intervention. However, methodological variations, such as music genre choices and intervention duration, warrant deeper examination. Some studies, like Giordano et al and Gökçek et al, reveal that MT can substantially lower anxiety levels among patients undergoing surgical procedures, validating its positive impact.[5,15] However, the Wakana et al study did not demonstrate a significant reduction in anxiety for patients with dental fear undergoing oral surgery, highlighting the critical role of contextual elements.[14] This emphasizes that MT's efficacy can vary according to the patient population and their specific fears, proving that a single approach is not appropriate in the application of MT. While each study adheres to strict methodologies, including RCTs and Systematic Reviews, this variability indicates that MT's success might depend on factors beyond simply playing music, such as patient preferences, the clinical setting, and the type of procedure being performed. Consequently, adopting a patient-centered approach and tailoring MT to individual patient needs and surgical contexts might be key to optimizing its potential. This exhaustive comparative analysis calls for a more

personalized approach to implementing MT in health-care settings, acknowledging the vital interplay among methodology, patient attributes, and the intervention's efficacy.

Definition of Terms

Anxiety

Anxiety is characterized as a condition exhibiting both physical and emotional symptoms, such as an increased heart rate, worry, and unease.[4,9] This state is particularly notable in the context of anesthesia, where it pertains to the apprehension patients often feel prior to surgery, potentially impacting both their immediate and long-term recovery phases.

Pain

Pain is defined as an unpleasant sensory and emotional experience that might be associated with actual or potential tissue damage.[9] This phenomenon is a critical focus in the field of anesthesia, where the goal is to manage pain effectively during and after surgical procedures to achieve optimal patient outcomes.

Hypertension

Hypertension is a chronic medical condition wherein a person's arterial blood pressure is constantly elevated. In anesthesia, meticulous management of the condition is essential because it influences the selection of anesthetic agents and methods, as well as the general perioperative risk to the patient.

Sedation

Sedation involves the use of medications to reduce a patient's irritability or agitation, most commonly to facilitate the commencement of a medical or diagnostic procedure.[4] Within anesthetic practice, the level of sedation can vary from minimal to deep, which significantly impacts the anesthetic management and monitoring strategies employed.

Discussion

Several studies have investigated the effectiveness of MT as an alternative intervention for reducing preoperative anxiety in adult surgical patients. These studies compared MT with conventional pharmacological interventions like Midazolam and assessed their impact on anxiety levels, pain perception, physiological parameters, and patient satisfaction.

Findings from these studies indicate that patient-choice music and binaural tone music were more effective than Midazolam in reducing anxiety levels during spinal anesthesia surgeries. Similarly, preoperative MT was found to be as effective as Midazolam in reducing anxiety levels before stomatology surgeries. Different types of music, particularly Classical Turkish music, significantly reduced preoperative anxiety levels. However, MT failed to significantly reduce anxiety levels in patients with dental fear undergoing oral surgery or dental treatment with intravenous sedation.

Additional evidence suggests that MT can successfully lessen preoperative anxiety and pain and improve patient comfort across various surgical procedures. These findings highlight MT's potential as a safe, cost-effective, and noninvasive intervention for managing preoperative anxiety in surgical settings.

Further research is needed to explore the ideal timing, duration, and types of MT to maximize their benefits and address specific patient populations' needs.

Conclusion

This encyclopedic literature review points to the significance of addressing preoperative anxiety in surgical patients. This type of anxiety, marked by apprehension and distress, has wide-ranging effects, impacting not just the patients' immediate experiences but also the health-care system and the economy.

The literature presents a mixed but encouraging outlook on MT's potential to reduce preoperative anxiety and promote relaxation in patients undergoing invasive procedures. Notably, it has been associated with the activation of the parasympathetic nervous system, a minimizing of sympathetic activity, and an enhancement of emotional well-being. However, further research is required to ascertain its efficacy. High patient satisfaction levels indicate MT's positive influence on the overall surgical experience.

Additionally, the literature highlights the benefits of considering nonpharmacological interventions alongside traditional ones, lending a more comprehensive and patient-centered approach to care. Tailoring MT to individual preferences, including music choices, duration, and timing, has emerged as an auspicious approach. Moreover, it promises the hope of alleviating the financial strain of preoperative anxiety on patients and health-care systems. Therefore, in the pursuit of improved patient outcomes and well-being, incorporating nonpharmacological interventions, such as MT, is essential for effectively managing preoperative anxiety.

Organizational Assessment

This section comprehensively assesses the organizational context and framework for implementing the DNP project, which focuses on using MT to lower anxiety in adult patients undergoing invasive procedures. The goal is to fully understand the clinical practice site, including its unique challenges and opportunities, and to align the project's objectives with these identified issues. Additionally, this section aims to define the roles of key stakeholders and participants, outline SMART objectives, and critically evaluate the theoretical framework to be applied. Ultimately, this assessment lays the foundation for the subsequent phases of this DNP project.

Primary DNP Project Goal

The primary goal is to investigate the possibility of music's efficacy as an alternative intervention to reduce preoperative anxiety in patients undergoing invasive procedures. Many patients experience stress before these procedures, and the current practice in combatting this frequently involves administering anxiolytics like midazolam, which can have adverse side effects. The project aims to assess whether offering music as an intervention for anxiety reduction can provide a safe and effective alternative. The objective is to provide patients with choices of music genres, empowering them to actively participate in managing their preoperative anxiety.

The health-care facility selected as the site of investigation is a prominent 716-bed hospital with a dedicated team of 3,200 medical professionals and more than 700 physicians. Its mission is to provide quality health care to its patients, support all physician and employee needs, and deliver world-class health care to the community. The organization's principles embrace diversity and inclusion, workplace happiness, purpose, charitable giving, and 5-star values. The facility's relevance to this project is evident as it performs a wealth of invasive procedures on hospitalized and outpatient surgery patients daily, making it an ideal location for assessing music as an intervention to reduce anxiety and comparing its effectiveness to using midazolam.

Preoperative anxiety is a pressing concern for patients undergoing invasive procedures. This form of anxiety greatly impacts patient well-being and surgical outcomes, leading to physiological responses that can lead to complications. Patients' psychological distress during this period necessitates the use of anxiolytics, such as midazolam.

At the site of investigation, the current approach to combatting preoperative anxiety for

patients undergoing invasive procedures involves primarily administering midazolam, a pharmacological agent. Although midazolam effectively ensures hemodynamic stability during the preoperative and intraoperative phases, concerns arise due to its limited half-life and potential complications. Moreover, the conflicting findings in studies on preoperative midazolam use, including complications like delirium, emphasize the need for nonpharmacological interventions, such as MT, to address preoperative anxiety effectively. However, incorporating MT as a standard practice remains limited, highlighting a gap between the current practice of relying on pharmacological methods and the potential advantages of utilizing nonpharmacological interventions like MT. Further research is needed to explore the comparative effectiveness of pharmacological and nonpharmacological methods for patients undergoing invasive procedures.

In this QI project aimed at using MT to reduce patients' anxiety when undergoing invasive procedures, health-care professionals who typically use pharmacological methods to manage anxiety are vital contributors. The QI project advisor also provides essential support and guidance throughout the project's development and execution. Although there are no external sponsors or stakeholders, the collaborative efforts of these medical professionals, along with the QI project advisor, are essential to the project's success.

A sample size of roughly 10 participants composed of Registered Nurses (RNs), Certified Registered Nurse Anesthetists (CRNAs), and Anesthesiologists will be involved and play crucial roles in the perioperative care of patients undergoing invasive procedures. RNs are crucial for patient preparation and postoperative care, while CRNAs and Anesthesiologists administer and monitor anesthesia perioperatively. The cooperation of these diverse health-care professionals ensures a cohesive representation of the perioperative care team, fostering a more

holistic assessment of how MT affects anxiety management in patients undergoing invasive procedures. This participant group reflects the multidisciplinary nature of perioperative care and enhances the potential applicability of the project's findings across different health-care settings.

SMART Objectives

In this QI project, a set of SMART objectives has been established to address the unique challenges of efficiently reducing preoperative anxiety via MT for patients undergoing invasive procedures. The SMART objectives are as follows:

Specific

The specific goal is to ensure that health-care professionals, including RNs, CRNAs, and Anesthesiologists, fully understand the benefits of MT in reducing preoperative anxiety and are prepared to implement it as an adjunctive therapy during the perioperative period effectively.

Measurable

The interventions' effectiveness will be measured through pre- and postoperative assessments of patient anxiety using State Anxiety Scales and interviews. The goal is to witness a pronounced decrease in anxiety levels after the intervention. Additionally, staff will be interviewed to assess the ease of implementing these interventions.

Achievable

The goal is to provide medical professionals with advanced knowledge and training, enabling them to collaborate in implementing MT as an integral part of anxiety management during invasive procedures. With the proper education and resources, this objective is achievable and practical

Realistic

Introducing MT as an anxiety-reduction intervention is attainable within the perioperative setting, where anxiety management is crucial. Online educational modules will be provided to make this education accessible to health-care professionals, regardless of their schedules.

Timely

The desired outcome of this QI project is to supplement the knowledge and skills of health-care professionals in using MT to manage anxiety. Initially, a pre-test will be conducted to assess the participating medical professionals' baseline knowledge and measure MT's effectiveness as an interventional method. Next, an educational PowerPoint (PPT) presentation covering various aspects of MT will be held. Lastly, a post-test will be administered to gauge the increase in knowledge and assess the efficacy of the PPT presentation.

Description of the Program Structure

In this QI project, a comprehensive organizational needs assessment was performed to establish a baseline for managing preoperative anxiety with MT in patients undergoing invasive procedures. The evaluation revealed several critical factors that accentuate the need for this QI project. A review of existing information within the health-care organization revealed a remarkable prevalence of preoperative anxiety among patients undergoing invasive procedures. This data included preoperative anxiety scores, patient feedback, and records of complications related to anxiety, such as increased postoperative pain and extended hospital stays. Additionally, the assessment exposed a gap in using nonpharmacological interventions, such as MT, within the perioperative setting, highlighting the need for a comprehensive project to instruct health-care professionals in this approach.

Furthermore, consultations with key stakeholders, including health-care administrators, perioperative staff, and clinical educators, emphasized the importance of managing preoperative anxiety to boost patient outcomes. Collaboration with various departments, including nursing educators and perioperative teams, is instrumental for successfully completing this QI project. This cooperation will contribute to the seamless application of MT as an effective intervention for reducing anxiety during the perioperative period.

Organizational SWOT Analysis

A SWOT analysis was conducted, identifying the weaknesses, strengths, opportunities, and threats associated with implementing MT for reducing preoperative anxiety in patients undergoing invasive procedures. The SWOT matrix is a valuable tool for understanding the myriad factors that could impact the project's success.

Strengths

This QI project's strength is its commitment to evidence-based care, with the goal of enriching patient outcomes by managing preoperative anxiety with MT. By lowering anxiety levels and potentially reducing reliance on pharmacological treatments, this project improves patient experiences and supports the organization’s dedication to comprehensive patient care.[1,3,13,23-25] The emphasis on a collaborative, multidisciplinary approach aligns with the organization's mission of promoting technology, research, and academics in health-care.[1,3,13]

Weaknesses

A potential weakness of the QI project is the need for the organization to invest in the necessary technology and resources for implementing MT.[23-25] The expenses associated with acquiring equipment, providing training, and hiring personnel could pose a challenge, though highly unlikely. Additionally, addressing any misconceptions or skepticism within the

literature about the efficacy of MT could require targeted educational efforts.[23-25] It is also important to ensure proper implementation and address any potential resistance from staff and patients.[23-25]

Opportunities

The QI project offers an opportunity for standardizing MT in the perioperative period, encouraging consistency across health-care providers, and upgrading patient outcomes. MT standardization can reduce confusion and enhance the intervention's overall effectiveness.[23-25] Furthermore, the assimilation of MT could lead to decreased reliance on pharmacological interventions, contributing to a reduction in adverse events during recovery and facilitating earlier patient discharge.[1,3,13]

Threats

The primary threat to the QI project's success lies in the potential lack of support or compliance from health-care professionals involved in perioperative care.[23-25] Collaborative agreement among surgeons, anesthesia personnel, and nurses is essential for consistent implementation. Without appropriate investment and education, challenges could arise in ensuring staff and patient understanding and compliance with MT.[23-25] Addressing these threats is crucial to achieving positive patient outcomes.

Conceptual Underpinning and Theoretical Framework

Using theoretical frameworks and evidence-based practice is instrumental in guiding clinical decision-making in nursing care. Theoretical frameworks provide a structured foundation, creating a systematic way to comprehend, analyze, and address complex clinical situations. They help develop evidence-based practices, ensuring nursing interventions are based on established principles.[26] In the context of this QI project, Kolcaba's Theory of Comfort is the

theoretical framework that will be applied. This theory is particularly relevant as it focuses on enhancing patients' comfort, aligning with a holistic approach to nursing care.[26] By incorporating Kolcaba's Theory of Comfort, the project aims to systematically address the comfort needs of patients undergoing MT, recognizing the connection between comfort and overall well-being.

Theory Overview

As mentioned, Kolcaba's Theory of Comfort is a nursing theory that centers on comfort as a fundamental aspect of patient care.[26] Developed by Katharine Kolcaba, the theory identifies 3 forms of comfort: relief, ease, and transcendence.[26] Relief pertains to alleviating specific discomforts, ease involves the state of calm and contentment, and transcendence goes beyond physical comfort to encompass spiritual and existential well-being.[26] The theory suggests that nurses can improve the overall patient experience and outcomes by focusing on these dimensions of comfort. Kolcaba's Comfort Theory is structured around 4 meta paradigms: the person, environment, health, and nursing.[26] These elements are interconnected, influencing the patient's comfort levels. Applying this theory in this QI project, which compares MT to Midazolam and its effects on reducing anxiety, aligns with its core principles of holistic patient care. It ensures that the therapeutic interventions address the physical, emotional, and spiritual dimensions of comfort.

Theory/Clinical Fit

Kolcaba's Theory of Comfort aligns well with this QI project. The theory's focus on holistic comfort matches the objectives of MT, which aims to enhance the overall well-being of individuals. Music has been acknowledged for its therapeutic potential, contributing to emotional expression, stress reduction, and relaxation.[1,3,13] By assimilating Kolcaba's Theory of

Comfort, the project recognizes the multidimensional nature of comfort, which reaches beyond physical sensations to encompass emotional and spiritual elements. This holistic approach is particularly apropos in MT, as it aims to alleviate discomfort and foster a sense of ease and transcendence. The theory guides the project in systematically assessing and addressing patients' comfort needs as they receive MT, ensuring that the intervention is customized to enhance the overall comfort experience and contribute to positive health outcomes.

Theory Evaluation

Kolcaba's Theory of Comfort clearly defines key concepts, envisaging comfort as a holistic outcome of nursing care that includes physical, psychospiritual, environmental, and sociocultural facets.[26] This comprehensive approach reinforces the holistic nature of nursing care and provides a versatile framework suitable for numerous clinical settings, including MT. Implementing Kolcaba's concepts of physical, psychospiritual, environmental, and sociocultural comfort is practical. Established instruments and tools help measure these areas, facilitating their use in clinical settings. For example, in this QI project, these tools can be used to evaluate and measure the effect MT has on patients' comfort levels, in accordance with Kolcaba's framework.

Kolcaba's theory effectively highlights the relationships among its central concepts, illustrating how physical, psychospiritual, environmental, and sociocultural comforts are linked. Recognizing these dimensions as interdependent realms emphasizes the theory's comprehensive nature and validates its relevance in holistic patient care.

The theory's relational statements are clear and consistent. The theory suggests that interventions targeting 1 area of comfort can positively influence others. For example, incorporating MT to enhance psychospiritual comfort might also heighten physical comfort. This

clarity and consistency contribute to the theory's practical application in guiding nursing interventions.

Furthermore, Kolcaba's theory is designed for empirical testing. Researchers have developed tools and methods for calculating comfort-related variables across health-care settings. In this QI project, these tools are employed to evaluate the impact MT has on various comfort dimensions, helping to uphold the theory through empirical evidence.

Numerous studies have tested Kolcaba's Theory of Comfort in examining the effectiveness of comfort interventions. While many studies support the theory's principles, continued research is essential to refine its applications further. Engaging with existing literature on these studies provides valuable insights into the theory's strengths and areas for potential improvement.

QI Project – Methodology

In health care, the methodology provides a framework for leading quality improvement initiatives. It is an orderly approach to plan, execute, and evaluate interventions to enhance patient care. In this QI project, the methodology outlines the steps to explore MT's effectiveness in reducing preoperative anxiety among adults in a large hospital setting. This section provides a detailed overview of the QI project, including participant selection, procedure details, data collection methods, and analysis tactics. It sets the basis for understanding how the project will unfold, aiming to improve the patient experience in a large hospital setting.

Setting and Participants

A large, renowned hospital with a committed team of medical professionals and physicians is the primary setting for this QI project. The hospital's mission centers on

delivering quality health care to the community. This QI project focuses on investigating MT's effectiveness in mitigating preoperative anxiety among adults undergoing invasive procedures.

The facility's relevance to the project is underscored by the high incidence of preoperative anxiety among patients undergoing invasive procedures. Often, midazolam is administered as a pharmacological intervention to reduce this anxiety, which can affect patient well-being and surgical outcomes. However, the limitations surrounding pharmacological approaches point to the need for alternatives like MT. The hospital's dedication to quality care supports exploring such alternative strategies. The chosen sample size of approximately 10 participants, which includes RNs, CRNAs, and Anesthesiologists, ensures a well-rounded representation of the perioperative care team, allowing a thorough evaluation of MT's impact on anxiety management in patients undergoing invasive procedures.

Procedures

A pre/post-test combined with an educational PowerPoint (PPT) presentation will be given to evaluate the knowledge, attitudes, and practical experiences of the QI project's participants, including RNs, CRNAs, and Anesthesiologists. The pre-test will establish a baseline for their preliminary understanding and attitudes toward preoperative anxiety management with MT. After the PPT presentation on MT, the post-test will assess the participants' current knowledge and insights.

Participant Recruitment

Roughly 10 to 20 potential participants will be contacted via an email that will include an anonymous link from the Qualtrics platform to ensure privacy and ease of access. The email will detail the purpose and design of the educational intervention, enabling potential participants to fully grasp the nature and scope of the project.

Participants are invited to join this study voluntarily. If they choose to participate, they will be asked to consent formally before proceeding.

Data Collection

A comprehensive methodology was used to gather data and assess MT's impact on the knowledge and attitudes of the QI project's participants regarding the management of preoperative anxiety. No participant identifiers will be recorded at any stage of the project, further securing confidentiality. The following components are entailed in the data collection:

Pre- and Post-Module Assessments

Pre- and post-tests were administered through an anonymous online survey utilizing the Qualtrics platform. These assessments, conducted before and after the educational PPT presentation, will serve as critical benchmarks for comparing participants' knowledge and attitudes. The inquiry will include questions designed to evaluate their understanding of preoperative anxiety management, MT's role, and their readiness to incorporate MT into their practice.

Pre-Test

The pre-test will act as a baseline assessment, capturing participants' initial knowledge and attitudes regarding preoperative anxiety management, including MT. This first assessment will help measure the participants' receptiveness before the PPT presentation on MT.

Post-Test

After the PPT presentation, a post-test will be given to evaluate any new knowledge and participants' readiness to apply it in their clinical practice. A positive change in knowledge and attitudes will indicate the effectiveness of the educational intervention.

Post-Program Survey

At the project's conclusion, participants will receive a survey to garner feedback on their overall experience, including MT's effectiveness, the educational PPT, and the entire process.

This survey will help refine future implementations and gather participants' views on the intervention and its impact. The data collection tools' reliability and validity will be appraised to ensure they accurately measure the changes in participants' knowledge, providing a solid basis for assessing MT's effectiveness.

Data Analysis

The data from the pre- and post-tests and insights gleaned from the participant survey will be statistically analyzed to evaluate participants' knowledge and attitudes toward managing preoperative anxiety with MT. Detailed statistics will summarize participant demographics, emphasizing characteristics like means, standard deviations, and frequencies to deliver a comprehensive profile of the study's sample. For inferential analysis, paired-sample t-tests and chi-squared tests will be used to compare Pre- and Post-test mean scores and examine the statistical significance of changes in participant knowledge and attitudes. Additionally, the survey responses will be analyzed to identify common themes and patterns in feedback about the process, including the educational PPT presentation and MT's perceived impact on preoperative anxiety. By integrating the quantitative and qualitative data, this method aims to provide a well-balanced understanding of MT's effectiveness in managing preoperative anxiety, particularly for health-care professionals working with patients undergoing invasive procedures.

Data Management

All QI project-related materials, including participant information and documents, will be

stored on a password-protected laptop with encrypted document folders. Additionally, emails containing sensitive information will be encrypted to enhance data security. As for data disposal after the project, any physical documents will be securely shredded, and digital files will be permanently deleted from the laptop and any backup storage devices. Private participant information will be carefully managed throughout the project, using participant codes instead of personal identifiers to maintain confidentiality. The laptop will be further protected by being stored in a secure physical location when not in use.

Protection of Human Subjects

Maintaining privacy and confidentiality throughout the study is crucial for protecting human subjects. The recruitment process will employ a voluntary participation approach, with participants receiving an electronic informed consent form via a secure link in the recruitment email. This form delineates the project's purpose, procedures, potential risks, and benefits. The QI project will also seek and obtain Institutional Review Board (IRB) approval, reinforcing its commitment to ethical guidelines. All data, including consent forms, will be stored securely on password-protected devices to safeguard participant information. Communication will occur through encrypted emails to ensure an additional layer of security. Participants will be advised of the voluntary nature of their involvement and their right to withdraw from the study at any time. Risks associated with the project, particularly those related to MT, will also be communicated to participants during the informed consent process. This comprehensive approach aims to uphold the highest ethical standards and secure all participants' well-being and confidentiality.

Discussion of the Results with Implications for Advanced Nursing Practice

The study's conclusions on MT's effectiveness as an intervention for managing

preoperative anxiety hold important implications for advanced nursing practice in various fields. As anxiety remains a prevalent concern in patients undergoing invasive procedures, the incorporation of MT into preoperative care presents an innovative approach with many benefits.

The study's outcomes suggest that advanced nursing practice education programs should integrate MT principles into their curricula.[27,28] As future practitioners, students need to be equipped with the knowledge and skills to use MT effectively in reducing preoperative anxiety. Updating educational materials, training protocols, and clinical rotations must be done to ensure they align with evidence-based practices that improve patient outcomes.[27,28]

Incorporating MT into preoperative care necessitates health-care institutions to tweak their protocols and guidelines. Hospitals and surgical units must update their procedures to include MT, allocate resources for training health-care professionals, and institute the requisite infrastructure to support its implementation. Clinical Nurse Specialists (CNSs) and Nurse Practitioners (NPs) with expertise in evidence-based practice and patient-centered care will collaborate with interdisciplinary teams to integrate MT into existing care structures.[27,28] Their leadership will be pivotal in ensuring the successful adoption of MT as a standard component of preoperative anxiety management.

Ultimately, the beneficiaries of this study's outcomes are the patients themselves. The integration of MT aligns with the principles of patient-centered care, emphasizing the importance of addressing patients' emotional well-being in addition to their physical health.[27,28] This shift in practice signifies a commitment to enhancing patient satisfaction and overall well-being, promoting a more comprehensive approach to healthcare delivery.

Timeline

This QI project spans approximately 7 months. The first 2 months focus on developing

the survey and educational PPT presentation, during which FIU faculty and IRB approval are sought to move forward. The educational PPT will then be accessible for 1 month, followed by 2 months dedicated to data collection, analysis, and project write-up. By the end of the 7 months, the project aims to determine whether awareness and knowledge about using MT for preoperative anxiety management have increased and if there is greater support for its implementation in healthcare settings.

Results

Demographics

Table 1. Demographics

Position/Title	Count	Percentage
CRNA	8	73%
Anesthesiologist	1	9%
Resident	2	18%
Anesthesiologist Assistant	0	0%

Ethnicity	Count	Percentage
Hispanic	4	36%
Caucasian	5	45%
African American	0	0%
Asian	0	0%
Other	2	18%

Level of Education	Count	Percentage
Certificate	0	0%
Bachelors	1	9%
Masters	2	18%
DNP	7	64%
PhD	0	0%
MD/DO	1	9%

Age above 25	Count	Percentage
Yes	11	100%
No	0	0%

Years as a Perioperative Provider	Count	Percentage
1-2 years	3	27%
2-5 years	3	27%
5-10 years	3	27%
Over 10 years	2	18%

Gender	Count	Percentage
Male	6	55%
Female	5	45%
Non-binary / third gender	0	0%
Prefer not to say	0	0%

For this Quality Improvement project, 11 participants made up the sample size. Demographic information of these participants was retrieved as part of the questionnaire contained at the beginning of the survey after consent was obtained. The majority of participants identified as Caucasian (45%, n=5), followed by Hispanic (36%, n=4). Other ethnicities included 18% (n=2) categorized as 'Other,' while no participants identified as African American or Asian. In terms of professional roles, most participants were Certified Registered Nurse Anesthetists (CRNAs), representing 73% (n=8) of the sample. Anesthesiologists comprised 9% (n=1), and residents accounted for 18% (n=2), with no Anesthesiologist Assistants among the participants. Educational backgrounds varied, with the majority holding a Doctor of Nursing Practice (DNP) degree, making up 64% (n=7) of the group. Additionally, 18% (n=2) had a Master's degree, while 9% (n=1) each held Bachelors and MD/DO degrees. No participants reported having a Certificate or PhD. All participants were above the age of 25, representing 100% (n=11) of the sample. Regarding experience as perioperative providers, 27% (n=3) had 1-2 years, another 27% (n=3) had 2-5 years, 27% (n=3) had 5-10 years of experience, and 18% (n=2) had over 10 years

of experience. The gender distribution included 55% (n=6) male and 45% (n=5) female participants, with no participants identifying as non-binary or third gender, nor those who preferred not to say.

Summary of the Data

The study comprised 11 participants who formed the sample size and underwent a pre-test to assess their knowledge and attitudes towards using music therapy to reduce anxiety in clinical practice. Following the pre-test, an educational PowerPoint presentation was conducted to inform and educate the participants about the benefits and implementation of music therapy. Subsequently, a post-test was administered to evaluate the impact of the educational intervention. The table below compares the pre-test and post-test results, indicating the number and percentage of participants who correctly answered each question before and after the educational intervention.

Table 2. Pre-Test and Post-Test Results

#	Question	Pre-Test Correct	Post-Test Correct
1	Define Preoperative Anxiety	10 (91%)	11 (100%)
2	Up to what percentage does preoperative anxiety affect adults undergoing surgery?	4 (36%)	11 (100%)
3	Limitation of Midazolam for anxiety management	6 (55%)	11 (100%)
4	Emphasis is placed on exploring nonpharmacological interventions	10 (91%)	11 (100%)
5	Why is music therapy considered patient-centric?	11 (100%)	11 (100%)
6	Music therapy activates which nervous system to reduce anxiety?	7 (64%)	11 (100%)
7	According to research, Classical Turkish music is identified as more effective than Midazolam in reducing preoperative anxiety	10 (91%)	11 (100%)
8	How does music therapy contribute to streamlined healthcare?	10 (91%)	11 (100%)
9	Engaging healthcare professionals in the process is essential for music therapy implementation.	11 (100%)	11 (100%)

The pre-test results revealed varying levels of understanding among participants. For instance, while 91% (n=10) could define preoperative anxiety, only 36% (n=4) correctly identified the percentage of adults affected by preoperative anxiety. Similarly, only 55% (n=6) recognized the limitation of Midazolam for anxiety management. Notably, all participants correctly answered questions related to the patient-centric nature of music therapy and the importance of engaging healthcare professionals in the process, with 100% accuracy for these questions.

Post-test results showed a significant improvement in knowledge across all questions. Following the educational PowerPoint presentation, all participants (100%, n=11) correctly answered every question. This marked improvement underscores the effectiveness of the educational intervention in enhancing the participants' understanding of music therapy as a nonpharmacological intervention for anxiety management.

Specifically, the post-test results demonstrate increased awareness and acceptance of music therapy. For example, knowledge about the percentage of adults affected by preoperative anxiety rose from 36% to 100%, and understanding the limitation of Midazolam improved from 55% to 100%. Furthermore, the post-test confirmed that all participants recognized the efficacy of Classical Turkish music in reducing preoperative anxiety, aligning with existing research.

Likelihood of Music Therapy Implementation

Table 3. Likelihood to Incorporate Music Therapy

Likelihood to Incorporate Music Therapy	Pre-Test (n, %)	Post-Test (n, %)
Extremely unlikely	0 (0%)	0 (0%)
Somewhat unlikely	8 (73%)	0 (0%)
Neither likely nor unlikely	3 (27%)	4 (36%)
Somewhat likely	0 (0%)	7 (64%)
Extremely likely	0 (0%)	0 (0%)

The results of the pre-test and post-test regarding the likelihood of incorporating music therapy as a means to reduce anxiety in patients undergoing invasive procedures indicate a significant shift in attitudes among healthcare providers. Initially, the pre-test responses showed that a majority of participants, 73% (n=8), were somewhat unlikely to consider music therapy, and 27% (n=3) were neither likely nor unlikely to implement it. Notably, none of the participants (0%) expressed a likelihood to incorporate music therapy, whether somewhat or extremely.

However, the post-test results reveal a remarkable change. Following the educational PowerPoint presentation, none of the participants remained somewhat unlikely to incorporate music therapy. Instead, 36% (n=4) shifted to a neutral stance, neither likely nor unlikely, while a substantial 64% (n=7) became somewhat likely to use music therapy to reduce anxiety in patients undergoing invasive procedures. This shift from initial skepticism to a more favorable outlook underscores the effectiveness of the educational intervention in altering healthcare providers' perspectives towards the adoption of nonpharmacological anxiety management strategies.

Discussion

The Quality Improvement project successfully demonstrated that an educational PowerPoint presentation significantly enhances knowledge and acceptance of music therapy (MT) for managing preoperative anxiety. Notably, the findings suggest a substantial shift in healthcare providers' readiness to adopt MT, signaling a move towards more patient-centered care approaches.

This project contributes to the growing body of evidence supporting nonpharmacological interventions in medical settings, aligning with previous studies that have highlighted the benefits of music therapy in reducing patient anxiety and stress. Importantly, the consistent recognition of Classical Turkish music's effectiveness opens new pathways for specialized research into

culturally specific music therapies, which could lead to more tailored patient care strategies.

The enthusiasm for MT observed among participants underscores the potential for its integration into routine clinical practice, not only to enhance patient outcomes but also to enrich professional development for healthcare providers. By incorporating MT more systematically, health-care facilities can cultivate a holistic care environment that benefits both patients and practitioners.

The favorable response to the educational interventions suggests that ongoing education and training in nonpharmacological anxiety management should be a priority. Such initiatives could further solidify the implementation of innovative care techniques in standard medical procedures, ensuring that medical professionals are well-equipped to deliver the best possible patient care. Subsequent research should continue to expand upon these findings, exploring the long-term impacts of MT on patient recovery and health-care provider satisfaction, to wholly establish music therapy's efficacy and operational viability within diverse clinical settings.

Limitations

The QI project encountered several significant limitations that might have influenced its outcomes. The study's relatively small sample size of just a few participants could affect the wide-ranging applicability of our findings. Additionally, conducting the research within a single hospital setting might have restricted the variances in patient demographics and clinical practices observed, potentially biasing the results. Another challenge was the reliance on educational video presentations in lieu of live sessions, which might not have been as engaging for participants, possibly modifying their learning outcomes and the intervention's overall effectiveness. Also, limited health-care provider availability and scheduling conflicts constraining study participant availability might have introduced a selection bias. Despite these challenges, the insights

garnered from this project are indispensable and should be carefully considered as we interpret the results and plan further research or quality improvement initiatives.

Implications for Advanced Practice Nursing

Including music therapy (MT) in preoperative care protocols, as demonstrated by this Quality Improvement project, renders profound implications for advanced practice nursing. This integration not only addresses a critical aspect of patient care—managing preoperative anxiety—but also sets a precedent for introducing other holistic, non-pharmacological treatments into routine clinical practice.

For advanced practice nursing, adding MT to educational curricula is essential. Nursing programs should update their courses to include training on MTs uses and benefits, ensuring proficiency for all future nurse practitioners in a range of non-pharmacological interventions. This educational update will necessitate reviewing and revising existing modules to incorporate the latest research and practices surrounding anxiety management through music therapy.

Advanced practice nurses (APNs), including Clinical Nurse Specialists and Nurse Practitioners, are often at the forefront of implementing new therapies. With their leadership, MT can be seamlessly integrated into preoperative routines, ensuring that patients benefit from a reduction in anxiety and potentially better surgical outcomes. APNs can spearhead pilot programs within their institutions to demonstrate MT's efficacy, engendering broader adoption across health-care systems.

At the organizational level, embedding MT into routine care will require support through policy adjustments, including developing guidelines that formalize MT as a recognized method for managing anxiety. Health policy advocates among advanced practice nurses can champion these changes, arguing for the necessary resource allocation and training to support an MT

initiative.

MT's successful integration also relies on organizational support from health-care facilities. Advanced practice nurses can serve a strategic role in promoting the adoption of MT by participating in committees and policymaking processes that shape patient care protocols. Their expertise and firsthand knowledge of patient care dynamics are invaluable in making a case for holistic care approaches that include therapies like MT.

Ultimately, the widespread adoption of MT in preoperative care by advanced practice nurses could significantly enhance patient outcomes and satisfaction, marking a shift towards more compassionate and comprehensive patient care strategies.

Conclusion

The Quality Improvement project has demonstrated outstanding usefulness by enhancing health-care providers' understanding and acceptance of MT for managing preoperative anxiety. The educational intervention employed increased awareness while advancing a more empathetic and patient-centered approach in clinical settings.

The project has paved a strong foundation for the long-term integration of MT into routine practice, suggesting prolonged sustainability. Establishing structured training sessions and incorporating MT protocols in preoperative care guidelines are crucial for maintaining the benefits observed.

The potential for expansion to other contexts is promising. Given the universal prevalence of patient anxiety and MT's noninvasive nature, these findings can be adapted to myriad medical environments, ranging from small clinics to large hospitals, potentially even extending to outpatient care settings, where anxiety management remains a pivotal element of patient care.

The implications for practice and further study are profound. Practically, this project

encourages a move toward non-pharmacological interventions, aligning with current health-care trends toward more holistic treatment methods. Academically, it calls for additional research into the specific music genres that are most effective, examining not just clinical outcomes but also patient and provider preferences.

The next steps for quality improvement include refining the educational materials based on feedback, enlarging the participant base to include a greater range of health-care professionals, and evaluating MT's impact on other facets of patient care, such as postoperative recovery rates and overall patient satisfaction.

Lastly, the plan for sustaining the practice change involves integrating feedback mechanisms into the training modules, securing ongoing funding for program resources, and encouraging policy changes that support routine use of non-pharmacological methods in preoperative care. Organizational assistance from hospital administration will be critical, alongside advocacy for policy shifts that recognize and incentivize the use of such therapies.

References

1. Wang R, Huang X, Wang Y, et al. Non-pharmacologic approaches in preoperative anxiety, a comprehensive review. *Front Public Health*. 2022;10:854673. doi:10.3389/fpubh.2022.854673
2. de Andrade ÉV, Haas VJ, de Faria MF, et al. Effect of listening to music on anxiety, pain, and cardiorespiratory parameters in cardiac surgery: study protocol for a randomized clinical trial. *Trials*. 2022;23(1):278. doi:10.1186/s13063-022-06233-9
3. Giordano F, Giglio M, Sorrentino I, et al. Effect of preoperative music therapy versus intravenous midazolam on anxiety, sedation and stress in stomatology surgery: a randomized controlled study. *J Clin Med*. 2023;12(9):3215. doi:10.3390/jcm12093215
4. Mudgalkar N, Kandi V, Baviskar A, et al. Preoperative anxiety among cardiac surgery patients and its impact on major adverse cardiac events and mortality – a randomized, parallel-group study. *Ann Card Anaesth*. 2022;25(3):293-296. doi:10.4103/aca.aca_80_21
5. Kay M, Erol M, Kankilic N. The effect of Midazolam on delirium in patients undergoing coronary artery bypass surgery. *Ann Med Res*. 2020;27(3). Accessed June 17, 2023. https://annalsmedres.org/index.php/aomr/article/view/651
6. Bedaso A, Mekonnen N, Duko B. Prevalence and factors associated with preoperative anxiety among patients undergoing surgery in low-income and middle-income countries: a systematic review and meta-analysis. *BMJ Open*. 2022;12(3):e058187. doi:10.1136/bmjopen-2021-058187
7. Abate SM, Chekol YA, Basu B. Global prevalence and determinants of preoperative anxiety among surgical patients: a systematic review and meta-analysis. *International Journal of Surgery Open*. 2020;25:6-16. doi:10.1016/j.ijso.2020.05.010
8. Ni K, Zhu J, Ma Z. Preoperative anxiety and postoperative adverse events: a narrative overview. *Anesthesiol Periop Sci.* 2023;1(23). SpringerLink. Accessed September 6, 2023. https://link.springer.com/article/10.1007/s44254-023-00019-1
9. Jeon S, Lee HJ, Do W, et al. Randomized controlled trial assessing the effectiveness of midazolam premedication as an anxiolytic, analgesic, sedative, and hemodynamic stabilizer. *Medicine (Baltimore)*. 2018;97(35):e12187. doi:10.1097/MD.0000000000012187
10. Kumar V, Yadav P, Bangarwa N, et al. A randomized controlled trial to assess the efficacy of a preoperative virtual operation theatre tour on anxiety and patient satisfaction in adults undergoing elective surgery. *Cureus*. 2022;14(12):e32337. doi:10.7759/cureus.32337
11. Lorek M, Bak D, Kwiecien-Jagus K, Medrzycka-Dabrowska W. The effect of music as a non-pharmacological intervention on the physiological, psychological, and social response of patients in an intensive care unit. *Healthcare (Basel)*. 2023;11(12):1687. doi:10.3390/healthcare11121687

12. Prasad M, Sethi P, Kumari K, et al. Comparison of binaural tone music vs patient choice music vs midazolam on perioperative anxiety in patients posted for surgery under spinal anaesthesia: a randomized control trial. Cureus. 2023;15(2):e35091. doi:10.7759/cureus.35091
13. Graff V, Cai L, Badiola I, Elkassabany NM. Music versus Midazolam during preoperative nerve block placements: a prospective randomized controlled study. *Reg Anesth Pain Med.* 2019;44(8):796-799. https://doi.org/10.1136/rapm-2018-100251
14. Kühlmann AYR, de Rooij A, Kroese LF, et al. Meta-analysis evaluating music interventions for anxiety and pain in surgery. *Br J Surg*. 2018;105(7):773-783. doi:10.1002/bjs.10853
15. Ugras GA, Y1ld1r1m G, Yiksel S, et al. The effect of different types of music on patients' preoperative anxiety: a randomized controlled trial. *Complement Ther Clin Pract*. 2018;31:158-163. doi:10.1016/j.ctcp.2018.02.012
16. Wakana K, Kimura Y, Nitta Y, Fujisawa T. The effect of music on preoperative anxiety in an operating room: a single-blind randomized controlled trial. *Anesth Prog*. 2022;69(1):24-30. doi:10.2344/anpr-68-03-06
17. Gökçek E, Kaydu A. The effects of music therapy in patients undergoing septorhinoplasty surgery under general anesthesia. *Braz J Otorhinolaryngol*. 2020;86(4):419-426. doi:10.1016/j.bjorl.2019.01.008
18. Oyur Çelik G, Güzelçiçek A, Çelik S. The effects of music therapy on patients with coronary artery disease before the invasive procedure: a randomized controlled study. *J Perianesth Nurs*. 2022;37(2):194-198. doi:10.1016/j.jopan.2021.01.010
19. Casarin J, Cromi A, Sgobbi B, et al. Music therapy for preoperative anxiety reduction in women undergoing total laparoscopic hysterectomy: a randomized controlled trial. *J Minim Invasive Gynecol*. 2021;28(9):1618-1624.e1. doi:10.1016/j.jmig.2021.02.002
20. Lee HY, Nam ES, Chai GJ, Kim DM. Benefits of music intervention on anxiety, pain, and physiologic response in adults undergoing surgery: a systematic review and meta-analysis. *Asian Nurs Res (Korean Soc Nurs Sci)*. 2023;17(3):138-149. doi:10.1016/j.anr.2023.05.002
21. Padam A, Sharma N, Sastri OSKS, Mahajan S, Sharma R, Sharma D. Effect of listening to Vedic chants and Indian classical instrumental music on patients undergoing upper gastrointestinal endoscopy: a randomized control trial. *Indian J Psychiatry*. 2017;59(2):214-218. doi:10.4103/psychiatry.IndianJPsychiatry_314_16
22. Celebi D, Yzlmaz E, Sahin ST, Baydur H. The effect of music therapy during colonoscopy on pain, anxiety and patient comfort: a randomized controlled trial. *Complement Ther Clin Pract*. 2020;38:101084. doi:10.1016/j.ctcp.2019.101084
23. Robb SL, Hanson-Abromeit D, May L, et al. Reporting quality of music intervention research in healthcare: a systematic review. *Complement Ther Med*. 2018;38:24-41. doi:10.1016/j.ctim.2018.02.008
24. Cigerci Y, Kisacik OG, Ozyiurek P, Cevik C. Nursing music intervention: A systematic mapping study. *Complement Ther Clin Pract*. 2019;35:109-120. doi:10.1016/j.ctcp.2019.02.007
25. Oedegaared C. Health care workers' perspectives on the challenges and taylor & francis online. September 26, 2022. Accessed November 10, 2023. https://www.tandfonline.com/doi/full/10.1080/08098131.2022.2115530.
26. Bredow TS, Peterson SJ. *Middle Range Theories: Application to Nursing Research*

and Practice. Wolters Kluwer; 2017.
27. Ruiz Hernández C, Gómez-Urquiza JL, Pradas-Hernández L, et al. Effectiveness of nursing interventions for preoperative anxiety in adults: a systematic review with meta-analysis. *J Adv Nurs*. 2021;77(8):3274-3285. doi:10.1111/jan.14827
28. Medina-Garzón M. Effectiveness of a nursing intervention to diminish preoperative anxiety in patients programmed for knee replacement surgery: preventive controlled and randomized clinical trial. *Invest Educ Enferm*. 2019;37(2):e07. doi:10.17533/udea.iee.v37n2e07

Appendix A: Recruitment Letter

FIU Department of Nurse Anesthesiology

Nicole Wertheim College of Nursing & Health Sciences

Music Therapy To Reduce Anxiety In Patients Undergoing Invasive Procedures

Dear Envision Physician Services Perioperative Providers:

My name is Alex Witthoeft, and I am a student from the Anesthesiology Nursing Program Department of Nurse Anesthesiology at Florida International University. I am writing to invite you to participate in my quality improvement project. The goal of this project is to increase health care providers' awareness about the implementation of music therapy to reduce anxiety in patients undergoing invasive procedures. You are eligible to take part in this project because you are a part of the Envision Physician Services perioperative providers.

If you decide to participate in this project, you will be asked to complete and sign a consent form for participation. Next, you will complete a pre-test questionnaire, which is expected to take approximately 5 minutes. You will then be asked to view an approximately 15 minutes long educational presentation online. After going through the educational module, you will be asked to complete the post-test questionnaire, which is expected to take approximately 5 minutes. *No compensation will be provided.*

Remember, this is completely voluntary. You can choose to be in the study or not. If you'd like to participate or have any questions about the study, please email or contact me at 954-905-9049 and/or awitt019@fiu.edu.

Thank you very much.

Sincerely,

Alexander Witthoeft
954-805-9049
Awitt019@fiu.edu

Appendix B: IRB Approval

FIU | FLORIDA INTERNATIONAL UNIVERSITY

Office of Research Integrity
Research Compliance, MARC 414

MEMORANDUM

To:	Dr. Fernando Alfonso
CC:	Alexander Witthoeft
From:	Maria Melendez-Vargas, MIBA, Coordinator
Date:	April 26, 2024
Proposal Title:	"Music Therapy To Reduce Anxiety In Patients Undergoing Invasive Procedures"
	Approval # IRB-24-0079-AM01
	Reference # 113909

The Florida International University Office of Research Integrity has approved the following modification(s):

- Revised Project Date: 5/1/2024
- Revised Age Population: 25y - 59y and 60y and older
- Revised Methods and Procedures.
- Completed Virtually. No Face- To-Face contact.

Special Conditions:

For further information, you may visit the FIU IRB website at http://research.fiu.edu/irb.

MMV/em

Appendix C: Consent Form

FIU | FLORIDA INTERNATIONAL UNIVERSITY

CONSENT TO PARTICIPATE IN A QUALITY IMPROVEMENT PROJECT

Music Therapy To Reduce Anxiety In Patients Undergoing Invasive Procedures

SUMMARY INFORMATION
Things you should know about this study:

- **Purpose:** Educational module to increase providers awareness of implementing music therapy to reduce anxiety in patients undergoing invasive procedures
- **Procedures**: If the participant chooses to participate, they will be asked to complete a pre-test, watch a voice PowerPoint, and then a post test
- **Duration:** This will take about a total of 20 minutes total.
- **Risks**: There will be minimal risks involved with this project, as would be expected in any type of educational intervention, which may include mild emotional stress or mild physical discomfort from sitting on a chair for an extended period.
- **Benefits:** The main benefit to you from this research is increase the participants knowledge on implanting music therapy to reduce anxiety in patients undergoing invasive procedures.
- **Alternatives:** There are no known alternatives available to the participant other than not taking part in this quality improvement project.
- **Participation:** Taking part in this quality improvement project is voluntary.

Please carefully read the entire document before agreeing to participate.

NUMBER OF STUDY PARTICIPANTS:

If the participant decides to be in this study, they will be 1 of approximately 10 people in this research study.

PURPOSE OF THE PROJECT

The participant is being asked to be in a quality improvement project. The goal of this project is to increase providers' knowledge on implementing music therapy to reduce anxiety in patients undergoing invasive procedures. If you decide to participate, you will be 1 of approximately 10 participants.

DURATION OF THE PROJECT

The participation will require about 20 minutes

PROCEDURES

If the participant agrees to be in the project, PI will ask you to do the following things:
A. Complete an online 10 question pre-test survey via Qualtrics, an Online survey product for which the URL link is provided
B. Review the educational PowerPoint Module lasting 15 minutes via Qualtrics, an Online survey product for which the URL link is provided.
C. Complete the online 10 question post-test survey via Qualtrics, an Online survey product for which the URL link is provided.

RISKS AND/OR DISCOMFORTS
The main risk or discomfort from this research is minimal. There will be minimal risks involved with this project, as would be expected in any type of educational intervention, which may include mild emotional stress or mild physical discomfort from sitting on a chair for an extended period.

BENEFITS
The following benefits may be associated with participation in this project: An increased participants knowledge on implementing music therapy, which is a nonpharmacological intervention to reduce anxiety in patients undergoing invasive procedures. The overall objective of the program is to increase the providers' knowledge based on the current literature.

ALTERNATIVES
There are no known alternatives available to the participant other than not taking part in this project. However, if the participant would like to receive the educational material, it will be provided to them at no cost.

CONFIDENTIALITY
The records of this project will be kept private and will be protected to the fullest extent provided by law. If, in any sort of report, PI might publish, it will not include any information that will make it possible to identify the participant. Records will be stored securely, and only the project team will have access to the records.

PARTICIPATION: Taking part in this quality improvement project is voluntary.

COMPENSATION & COSTS
There is no cost or payment to the participant for receiving the health education and/or for participating in this project.

RIGHT TO DECLINE OR WITHDRAW
The participation in this project is voluntary. The participant is free to participate in the project or withdraw the consent at any time during the project. The participant's withdrawal or lack of participation will not affect any benefits to which you are otherwise entitled. The investigator reserves the right to remove the participant without their consent at such time that they feel it is in their best interest.

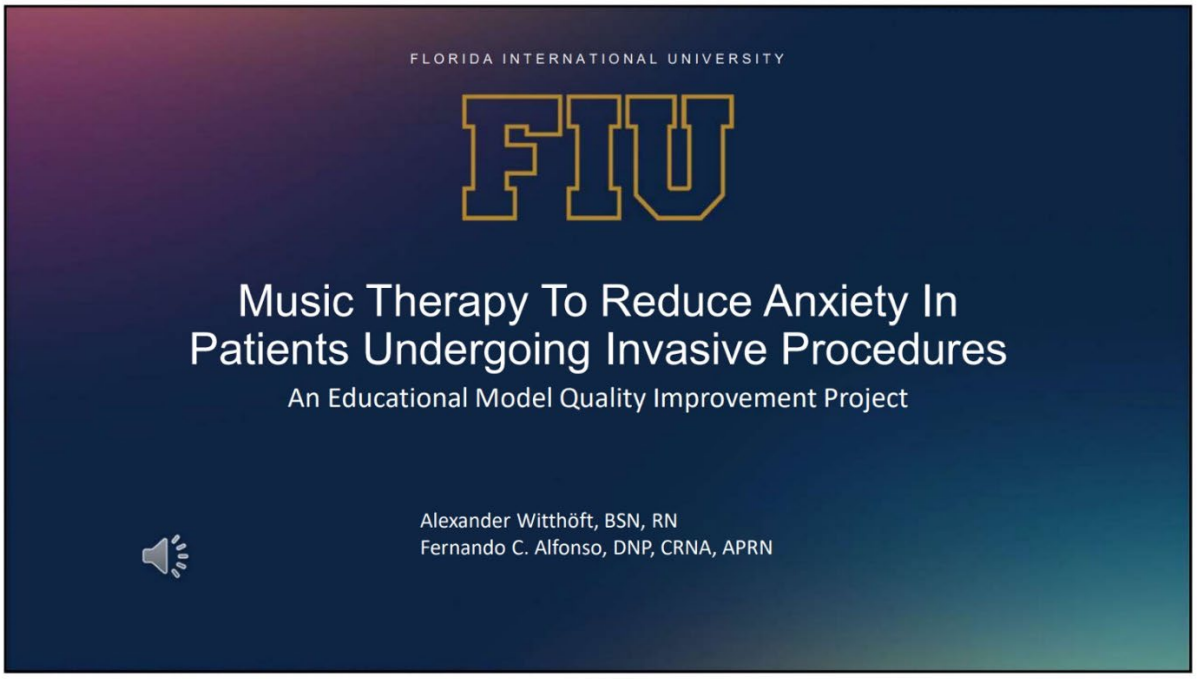
RESEARCHER CONTACT INFORMATION

If you have any questions about the purpose, procedures, or any other issues relating to this research project, you may contact Alexander Witthoeft at 954-805-9049/awitt019@fiu.edu and/or Dr. Fernando Alfonso at 305-348-3510/falfonso@fiu.edu.

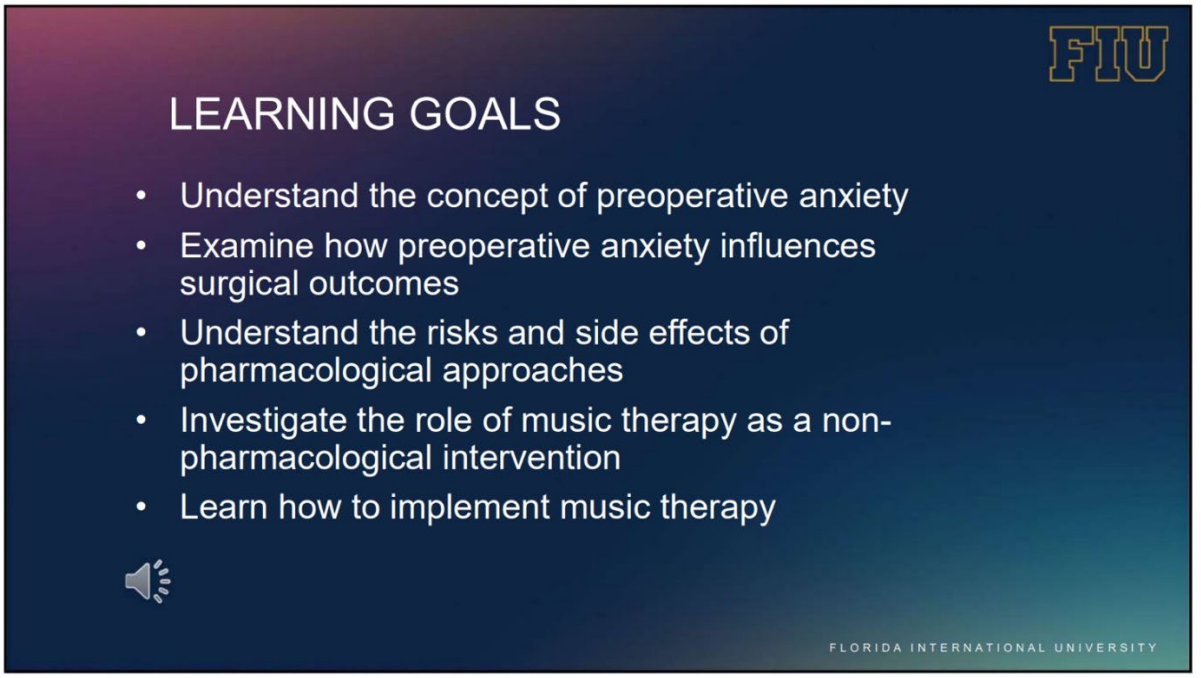
IRB CONTACT INFORMATION
If the participant would like to talk with someone about their rights pertaining to being a subject in this project or about ethical issues with this project, the participant may contact the FIU Office of Research Integrity by phone at 305-348-2494 or by email at ori@fiu.edu.

PARTICIPANT AGREEMENT
I have read the information in this consent form and agree to participate in this study. I have had a chance to ask any questions I have about this study, and they have been answered for me. By clicking on the "consent to participate" button below I am providing my informed consent.

Appendix D: Educational Module



1



2

BACKGROUND OF THE PROBLEM

- Preoperative anxiety affects up to 80% of adults[1-3]
- Traditional approach involves Midazolam[4]
- Conflicting findings with Midazolam use[5]
- Ongoing debate about Midazolam[6]

FLORIDA INTERNATIONAL UNIVERSITY

3

Global Impact and Economic Burden

- Preoperative anxiety is a widespread concern[3]
- Economic burden arises[4]
- Anxiety-induced complications[5]
- Reduced patient productivity and potential disability[5]
- Families and caregivers may face indirect economic consequences[5]

FLORIDA INTERNATIONAL UNIVERSITY

4

Challenges with Midazolam

- Midazolam has a short half-life[2,6]
- Limited ability to control anxiety effectively[6]
- Existing studies present conflicting findings[2,6]
- Concerns about adverse effects[2,6]

FLORIDA INTERNATIONAL UNIVERSITY

5

Ongoing Debates regarding Midazolam

- Discussions regarding Midazolam's efficacy and safety[6]
- Negative effects of Midazolam[2,6]
- Need to explore nonpharmacological interventions[2,6]
- Considering alternative approaches[2,6]

FLORIDA INTERNATIONAL UNIVERSITY

6

Why Music Therapy Implementation?[7-12]

- Proven Efficacy
- Patient-Centric Approach
- Cost-effective and easy to implement
- Minimization of Side Effects
- Increased effectiveness in conjunction with Medication

FLORIDA INTERNATIONAL UNIVERSITY

7

How does Music Therapy reduce Anxiety?[7-12]

- Activation of the Parasympathetic Nervous System
- Promoting relaxation
- Fosters a positive impact
- Encourages a state of mindfulness

FLORIDA INTERNATIONAL UNIVERSITY

8

What does the Research say?

- RCT comparing different types of music to Midazolam[7]
- Meta-analysis of 92 RCTs[9]
- RCT on the impact of different music types[10]
- Music Therapy's effects on Coronary Angiography patients[11]
- Systematic review of perioperative Music Therapy[12]

FLORIDA INTERNATIONAL UNIVERSITY

9

Significance to Nursing

- Alternative to Pharmacology
- Eliminate medication draw or wastage
- Patient-Centric Approach
- Streamlined Healthcare

FLORIDA INTERNATIONAL UNIVERSITY

10

How to Implement Music Therapy?

- Utilize a variety of devices
- Engage healthcare professionals
- Trained music therapists
- Encourage active patient participation
- Integrate music therapy seamlessly into the care routine

FLORIDA INTERNATIONAL UNIVERSITY

11

Take-Home Summary[1-12]

- Preoperative anxiety's global impact
- Economic burden
- Conflicting findings on Midazolam
- Ongoing debates
- Music therapy offers a proven and patient-centric approach
- Minimizes potential side effects
- Multiple benefits
- Research supports the efficacy of music therapy
- Implementing music therapy

FLORIDA INTERNATIONAL UNIVERSITY

12

References

1. Mudgalkar N, Kandi V, Baviskar A, et al. Preoperative anxiety among cardiac surgery patients and its impact on major adverse cardiac events and mortality- A randomized, parallel-group study. *Ann Card Anaesth*. 2022;25(3):293-296. doi:10.4103/aca.aca_80_21
2. Kay M, Erol M, Kankilic N. The effect of Midazolam on delirium in patients undergoing coronary artery bypass surgery. Annals of Medical Research. May 25, 2021. Accessed June 17, 2023. https://annalsmedres.org/index.php/aomr/article/view/651
3. Bedaso A, Mekonnen N, Duko B. Prevalence and factors associated with preoperative anxiety among patients undergoing surgery in low-income and middle-income countries: a systematic review and meta-analysis. *BMJ Open*. 2022;12(3):e058187. Published 2022 March 11. doi:10.1136/bmjopen-2021-058187
4. Abate SM, Chekol YA, Basu B. Global prevalence and determinants of preoperative anxiety among surgical patients: A systematic review and meta-analysis. *International Journal of Surgery Open*. 2020;25:6-16. doi:10.1016/j.ijso.2020.05.010
5. Ni K, Zhu J, Ma Z. Preoperative anxiety and postoperative adverse events: A narrative overview - anesthesiology and Perioperative Science. SpringerLink. July 17, 2023. Accessed September 6, 2023. https://link.springer.com/article/10.1007/s44254-023-00019-1.
6. Jeon S, Lee HJ, Do W, et al. Randomized controlled trial assessing the effectiveness of midazolam premedication as an anxiolytic, analgesic, sedative, and hemodynamic stabilizer. *Medicine (Baltimore)*. 2018;97(35):e12187. doi:10.1097/MD.0000000000012187

13

References cont'd

7. Prasad M, Sethi P, Kumari K, et al. Comparison of Binaural Tone Music vs Patient Choice Music vs Midazolam on Perioperative Anxiety in Patients Posted for Surgery Under Spinal Anaesthesia: a Randomized Control Trial. Cureus. 2023;15(2):e35091. Published 2023 Feb 17. doi:10.7759/cureus.35091
8. Giordano F, Giglio M, Sorrentino I, et al. Effect of Preoperative Music Therapy Versus Intravenous Midazolam on Anxiety, Sedation and Stress in Stomatology Surgery: A Randomized Controlled Study. J Clin Med. 2023;12(9):3215. Published 2023 April 29. doi:10.3390/jcm12093215
9. Kühlmann AYR, de Rooij A, Kroese LF, et al. Meta-analysis evaluating music interventions for anxiety and pain in surgery. Br J Surg. 2018;105(7):773-783. doi:10.1002/bjs.10853
10. Uğraş GA, Yıldırım G, Yüksel S, et al. The effect of different types of music on patients' preoperative anxiety: A randomized controlled trial. Complement Ther Clin Pract. 2018;31:158-163. doi:10.1016/j.ctcp.2018.02.012
11. Oyur Çelik G, Güzelçiçek A, Çelik S. The Effects of Music Therapy on Patients With Coronary Artery Disease Before the Invasive Procedure: A Randomized Controlled Study. J Perianesth Nurs. 2022;37(2):194-198. doi:10.1016/j.jopan.2021.01.010
12. Lee HY, Nam ES, Chai GJ, Kim DM. Benefits of Music Intervention on Anxiety, Pain, and Physiologic Response in Adults Undergoing Surgery: A Systematic Review and Meta- analysis. Asian Nurs Res (Korean Soc Nurs Sci). 2023;17(3):138-149. doi:10.1016/j.anr.2023.05.002

14

Appendix E: Pre-/Post-Test

FIU | FLORIDA INTERNATIONAL UNIVERSITY

Pre-Test and Post-Test Questionnaire:

Music Therapy To Reduce Anxiety In Patients Undergoing Invasive Procedures

INTRODUCTION

The primary aim of this QI project is to increase providers awareness of how Music Therapy can be used as a nonpharmacological intervention to reduce anxiety in patients undergoing invasive procedures.

Please answer the question below to the best of your ability. The questions are either in multiple choice or true/false format and are meant to measure knowledge about using Music Therapy to reduce anxiety in patients undergoing invasive procedures.

PERSONAL INFORMATION

1. Gender: Male _____ Female_____ Other_____
2. Ages: 25 and above _____
3. Ethnicity: Hispanic_____ Caucasian_____ African American_____ Asian_____ Other_____
4. Position/Title: CRNA_____ Anesthesiologist_____ Resident Anesthesiologist Assistant_____
5. Level of Education: Certificate_____ Bachelor's_____ Master's_____ DNP_____ PhD_____
6. How many years have you been a working as a healthcare professional? Over 10_____ 5-10 years_____ 2-5 years_____ 1-2 years_____

QUESTIONNAIRE

1. What does the learning goal "Define Preoperative Anxiety" involve?

A. Recognizing factors causing anxiety

B. Understanding the impact of anxiety on patients

C. Identifying surgical outcomes

D. Evaluating pharmacological limitations

E. All of the above

2. Up to what percentage does preoperative anxiety affect adults undergoing surgery?

A. 50%

B. 60%

C. 70%

D. 80%

3. What is a limitation of Midazolam for anxiety management?

A. Long half-life

B. Limited postoperative efficacy

C. Consistent findings on its association with complications

D. No concerns about adverse effects

4. Emphasis is placed on exploring nonpharmacological interventions.

True / False

5. Why is music therapy considered patient-centric?

A. It has a long half-life

B. It aligns with delivering comprehensive care

C. It requires medical monitoring

D. It is expensive

6. **Music therapy activates which nervous system to reduce anxiety?**

   A. Sympathetic Nervous System

   B. Parasympathetic Nervous System

   C. Central Nervous System

   D. Autonomic Nervous System

7. **According to research, Classical Turkish music is identified as more effective than Midazolam in reducing preoperative anxiety.**

   True / False

8. **How does music therapy contribute to streamlined healthcare?**

   A. Increases the need for medication

   B. Requires constant monitoring

   C. Saves nurses time and reduces stress

   D. Is difficult to implement

9. **Engaging healthcare professionals in the process is essential for music therapy implementation.**

   True / False

10. **How likely are you to incorporate music therapy as a means to reduce anxiety in patients undergoing invasive procedures?**

    A. Highly Likely

    B. Likely

    C. Unlikely

    D. Highly Unlikely

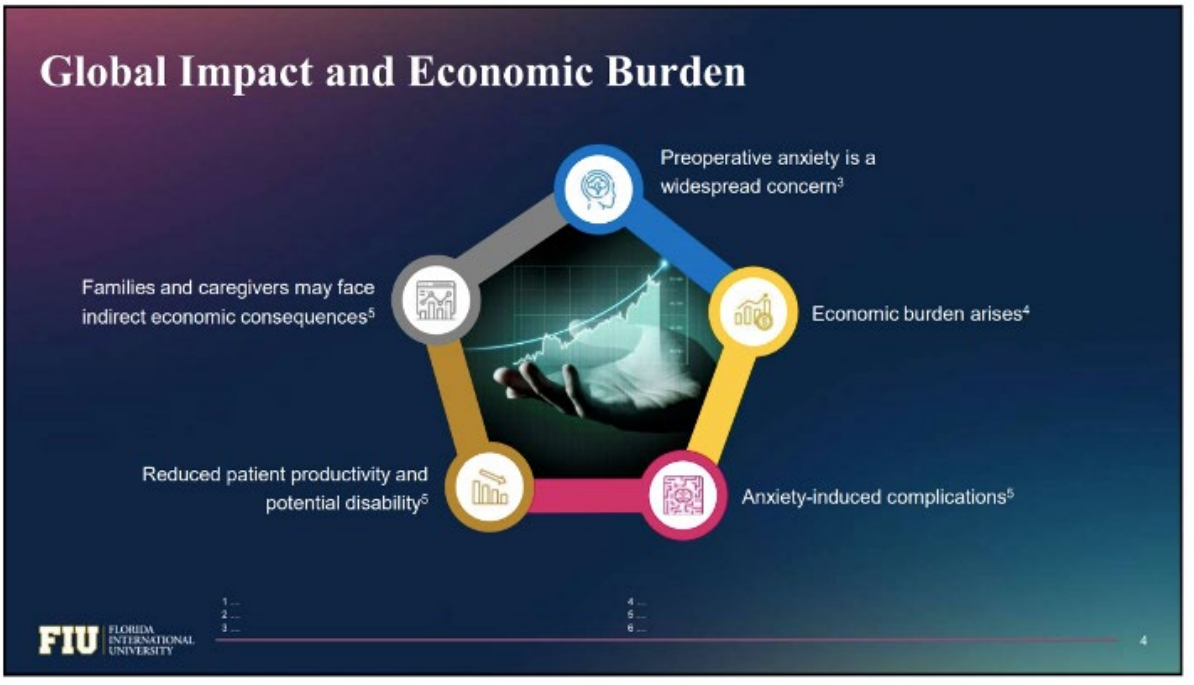
Appendix F: Dissemination Presentation

1

2


Background of the problem
Preoperative anxiety affects up to 80% of adults[1-3]
Traditional approach involves Midazolam[4]
Conflicting findings with Midazolam use[5]
Ongoing debate about Midazolam[6]
FIU FLORIDA INTERNATIONAL UNIVERSITY
3

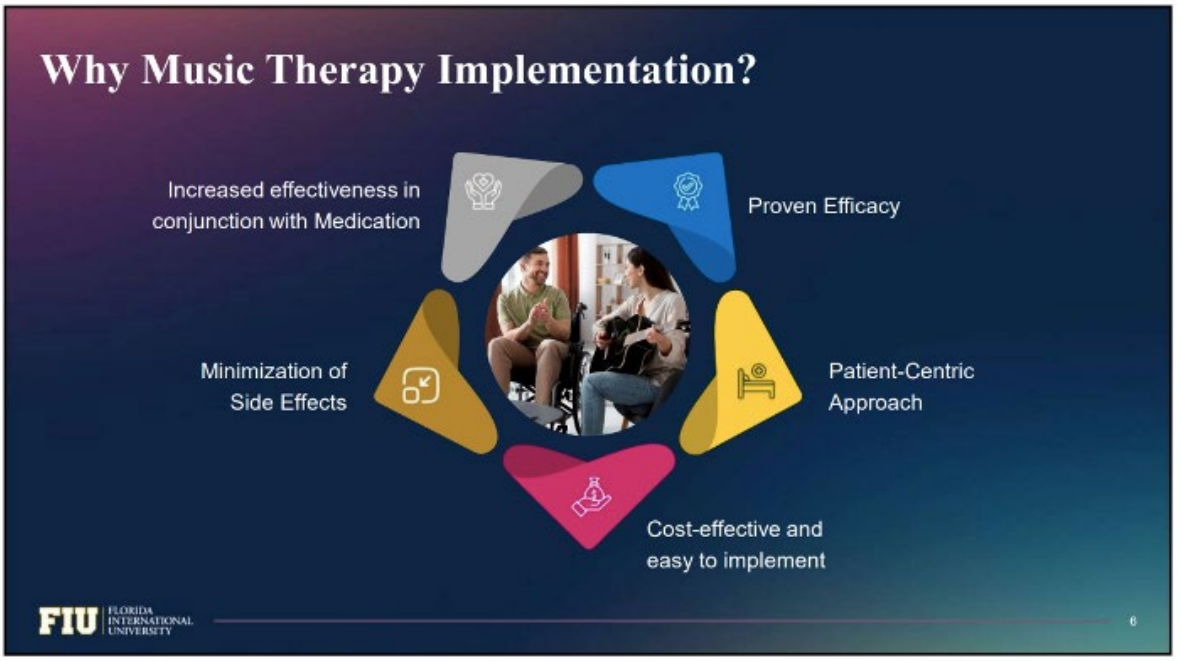
3


Global Impact and Economic Burden
Preoperative anxiety is a widespread concern[3]
Economic burden arises[4]
Anxiety-induced complications[5]
Reduced patient productivity and potential disability[5]
Families and caregivers may face indirect economic consequences[5]
FIU FLORIDA INTERNATIONAL UNIVERSITY
4

4


Challenges with Midazolam
Midazolam has a short half-life[2,6]
Limited ability to control anxiety effectively[6]
Concerns about adverse effects[2,6]
Existing studies present conflicting findings[2,6]
FIU FLORIDA INTERNATIONAL UNIVERSITY
5

5


Why Music Therapy Implementation?
Increased effectiveness in conjunction with Medication
Proven Efficacy
Minimization of Side Effects
Patient-Centric Approach
Cost-effective and easy to implement
FIU FLORIDA INTERNATIONAL UNIVERSITY
6

6


How does Music Therapy reduce Anxiety?
Activation of the Parasympathetic Nervous System
Promoting relaxation
Fosters a positive impact
Encourages a state of mindfulness
FIU FLORIDA INTERNATIONAL UNIVERSITY
7

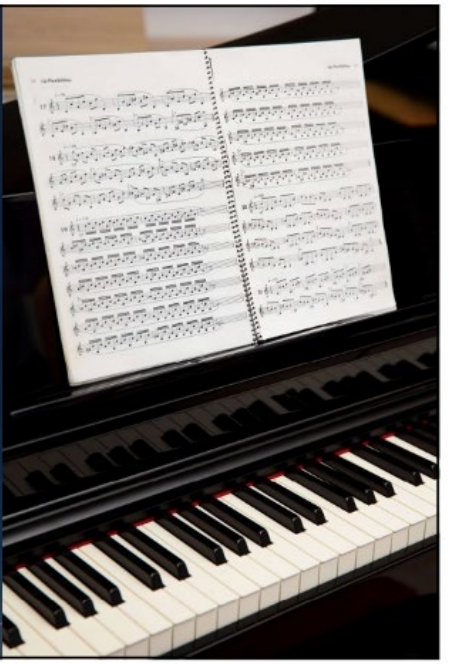
7


DNP Project Purpose
Educate Anesthesia Providers
Enhance the knowledge and awareness of anesthesia providers regarding preoperative anxiety
Address Preoperative Anxiety
Emphasize the significance of managing preoperative anxiety in patients undergoing invasive procedures
Pharmacological Limitations
Critically assess the risks associated with pharmacological interventions, highlighting the necessity for alternative strategies
Promote Music Therapy
Advocate for the integration of music therapy as an effective non-pharmacological intervention
Implement Practical Solutions
Equip anesthesia providers with practical knowledge and skills to effectively implement music therapy
FIU FLORIDA INTERNATIONAL UNIVERSITY
8

8

PICO Clinical Question

PICO	How does Music Therapy compare to administering Midazolam in reducing anxiety in adult patients undergoing invasive procedures?
Population (P)	Adult patients undergoing invasive procedures
Intervention (I)	Music therapy
Comparison (C)	Midazolam administration
Outcome (O)	Reducing anxiety



FIU FLORIDA INTERNATIONAL UNIVERSITY

9

Methodology of Quality Improvement Project

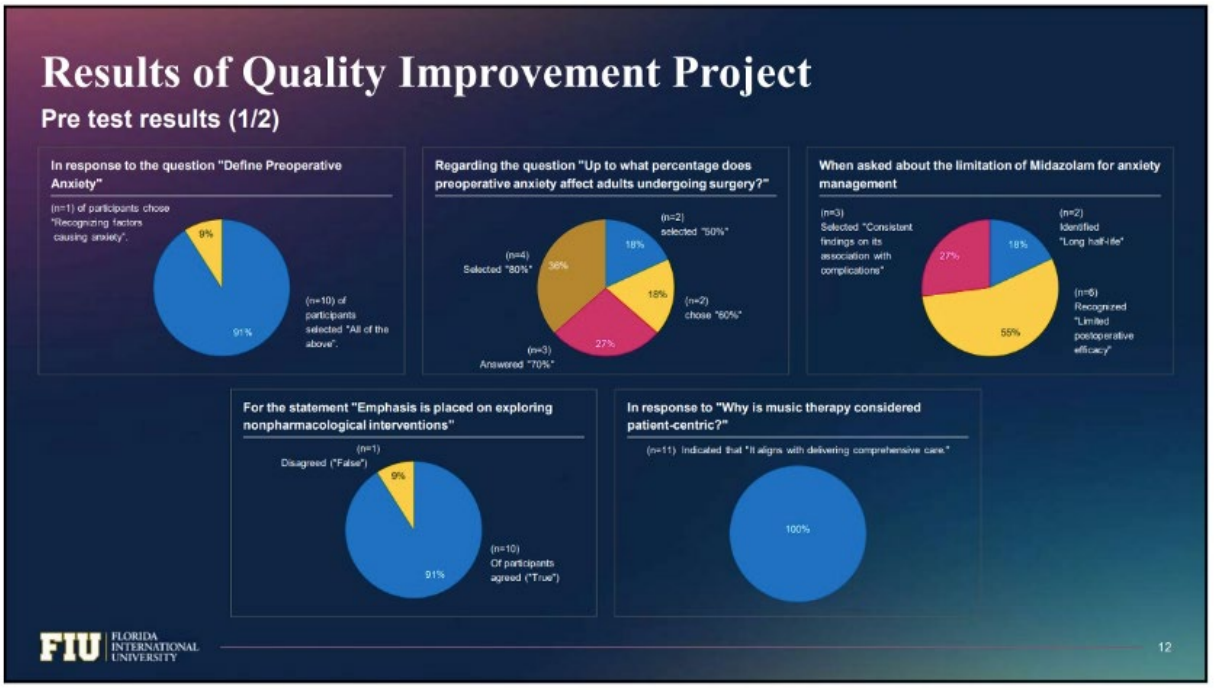
- IRB approval requested and granted from FIU
- Anonymous link sent to providers via email with link to Qualtrics containing pre and post questionnaires and the educational module.
- A voiceover PowerPoint was used to present the educational module.
- Data generated via Qualtrics questionnaires were exported into Excel spreadsheet for comparison between the pre and post-tests.

FIU FLORIDA INTERNATIONAL UNIVERSITY 10

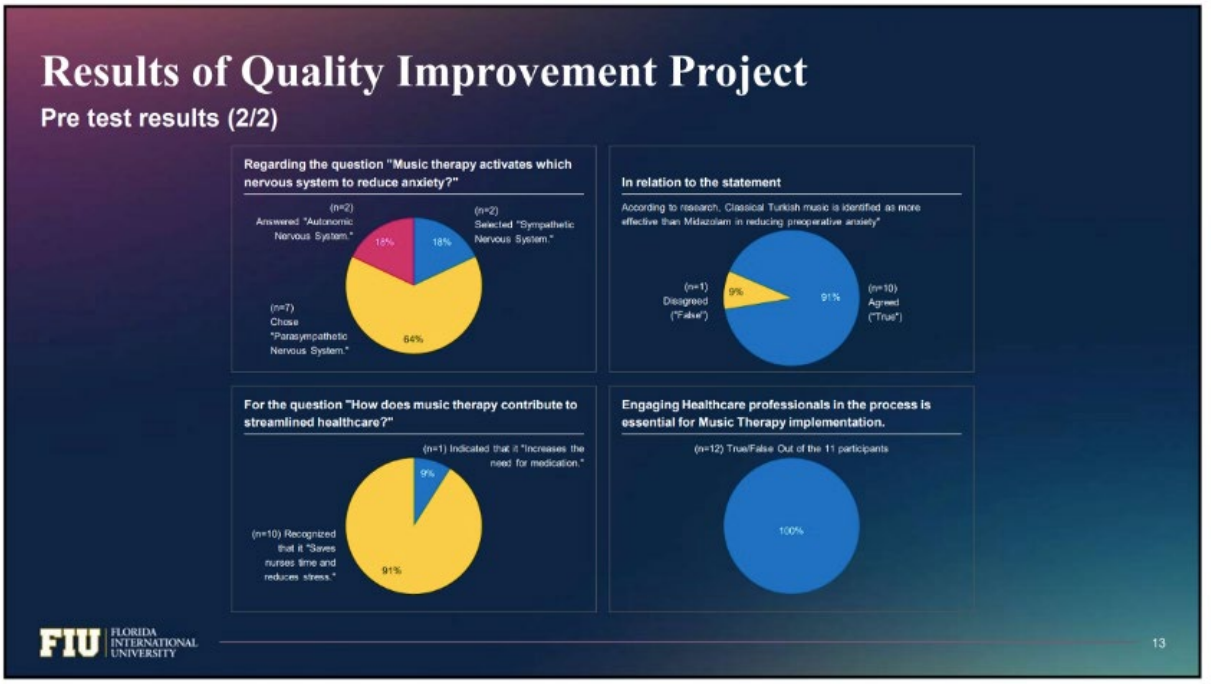
10


Results of Quality Improvement Project
Demographics
X Number of Participants
Ethnicity
11
Average
Hispanic 1
Caucasian 2
African American 0
Asian 0
Other 5
4 5 0 0 2
Position/Title
11
Percentage
CRNA 73%
Anesthesiologist 9%
Resident 18%
Anesthesiologist Assistant 0%
8 1 2 0
Level of education
11
QID5
Certificate 0%
Bachelors 9%
Masters 18%
DNP 64%
PHD 0%
MD/DO 9%
0 1 2 7 0 1
Age above 25
11
QID11
Yes 100
No 0
11 0
How many years have you been a perioperative provider?
11
QID6
1-2 years 27%
2-5 years 27%
5-10 years 27%
Over 10 years 18%
3 3 3 2
Pretest and posttest Questionnaire music therapy to reduce anxiety in patients
11
Average
Male 1%
Female 2%
Non-binary/ Third gender 0%
Prefer not to say 0%
6 5 0 0
FIU FLORIDA INTERNATIONAL UNIVERSITY
11

11


Results of Quality Improvement Project
Pre test results (1/2)
In response to the question "Define Preoperative Anxiety"
(n=1) of participants chose "Recognizing factors causing anxiety".
9%
91%
(n=10) of participants selected "All of the above".
Regarding the question "Up to what percentage does preoperative anxiety affect adults undergoing surgery?"
(n=2) selected "50%"
18%
(n=4) Selected "80%"
36%
18%
(n=2) chose "60%"
27%
(n=3) Answered "70%"
When asked about the limitation of Midazolam for anxiety management
(n=3) Selected "Consistent findings on its association with complications"
27%
(n=2) Identified "Long half-life"
18%
55%
(n=6) Recognized "Limited postoperative efficacy"
For the statement "Emphasis is placed on exploring nonpharmacological interventions"
(n=1) Disagreed ("False")
9%
91%
(n=10) Of participants agreed ("True")
In response to "Why is music therapy considered patient-centric?"
(n=11) Indicated that "It aligns with delivering comprehensive care."
100%
FIU FLORIDA INTERNATIONAL UNIVERSITY
12

12


Results of Quality Improvement Project
Pre test results (2/2)
Regarding the question "Music therapy activates which nervous system to reduce anxiety?"
(n=2) Answered "Autonomic Nervous System."
18%
(n=2) Selected "Sympathetic Nervous System."
18%
(n=7) Chose "Parasympathetic Nervous System."
64%
In relation to the statement
According to research, Classical Turkish music is identified as more effective than Midazolam in reducing preoperative anxiety"
(n=1) Disagreed ("False")
9%
91%
(n=10) Agreed ("True")
For the question "How does music therapy contribute to streamlined healthcare?"
(n=1) Indicated that it "increases the need for medication."
9%
(n=10) Recognized that it "Saves nurses time and reduces stress."
91%
Engaging Healthcare professionals in the process is essential for Music Therapy implementation.
(n=12) True/False Out of the 11 participants
100%
FIU FLORIDA INTERNATIONAL UNIVERSITY
13

13


Results of Quality Improvement Project
Post test results
In response to the question "Define Preoperative Anxiety"
(n=11) of participants selected "All of the above".
100%
Regarding the question "Up to what percentage does preoperative anxiety affect adults undergoing surgery?"
(n=11) Selected "80%"
100%
When asked about the limitation of Midazolam for anxiety management
(n=11) Recognized "Limited postoperative efficacy"
100%
For the statement "Emphasis is placed on exploring nonpharmacological interventions"
(n=11) Of participants agreed ("True")
100%
In response to "Why is music therapy considered patient-centric?"
(n=11) Indicated that "It aligns with delivering comprehensive care."
100%
Regarding the question "Music therapy activates which nervous system to reduce anxiety?"
(n=11) Chose "Parasympathetic Nervous System."
100%
In relation to the statement
According to research, Classical Turkish music is identified as more effective than Midazolam in reducing preoperative anxiety"
(n=10) Agreed ("True")
100%
For the question "How does music therapy contribute to streamlined healthcare?"
(n=11) Recognized that it "Saves nurses time and reduces stress."
100%
Engaging Healthcare professionals in the process is essential for Music Therapy implementation.
(n=11) Of participants agreed ("True")
100%
How likely are you to incorporate Music Therapy as a means to reduce anxiety in patients undergoing invasive procedures?
(n=11) Chose "Somewhat likely"
100%
FIU FLORIDA INTERNATIONAL UNIVERSITY
14

14


Discussion - Limitations
One hospital system participation
Delivery of educational video
Limited sample size
Availability of study participants
FIU FLORIDA INTERNATIONAL UNIVERSITY
15

15


Discussion - Future Implications
Implementation of Non-pharmacological Interventions
Professional Development and Training
Quality Improvement Initiatives
Enhanced Patient-Centered Care
Research and Evidence-Based Practice
FIU FLORIDA INTERNATIONAL UNIVERSITY
16

16

Conclusion

Despite prevalent preoperative anxiety and its impact on surgical outcomes, conventional pharmacological approaches like Midazolam may have limitations.

The Quality Improvement (QI) project showcased the potential of nonpharmacological interventions, particularly music therapy, in effectively managing preoperative anxiety among patients undergoing invasive procedures.

Through the QI project, anesthesia providers exhibited heightened knowledge and willingness to incorporate music therapy into preoperative care routines, indicating a positive association and a shift towards holistic patient-centered care.

However, challenges such as the limited sample size, single-hospital study, and the use of educational video presentations underscore the need for continued research and improved implementation strategies in anesthesia practice.

Moving forward, emphasis on education and training initiatives focusing on nonpharmacological interventions for anxiety management will be critical in enhancing patient outcomes and improving surgical care delivery.

FIU FLORIDA INTERNATIONAL UNIVERSITY

17

17

Acknowledgement

I would like to express my deepest gratitude to Dr. Fernando Alfonso and Dr. Javier Luces for their invaluable mentoring and support throughout this Quality Improvement project.

Additionally, I would like to thank all the participants of the QI project for their cooperation and contributions.

FIU FLORIDA INTERNATIONAL UNIVERSITY

18

18

References (1/2)

1. Mudgalkar N, Kandi V, Baviskar A, et al. Preoperative anxiety among cardiac surgery patients and its impact on major adverse cardiac events and mortality- A randomized, parallel-group study. Ann Card Anaesth. 2022;25(3):293-296. doi:10.4103/aca.aca_80_21
2. Kay M, Erol M, Kankilic N. The effect of Midazolam on delirium in patients undergoing coronary artery bypass surgery. Annals of Medical Research. May 25, 2021. Accessed June 17, 2023. https://annalsmedres.org/index.php/aomr/article/view/651
3. Bedaso A, Mekonnen N, Duko B. Prevalence and factors associated with preoperative anxiety among patients undergoing surgery in low-income and middle-income countries: a systematic review and meta-analysis. BMJ Open. 2022;12(3):e058187. Published 2022 March 11. doi:10.1136/bmjopen-2021-058187
4. Abate SM, Chekol YA, Basu B. Global prevalence and determinants of preoperative anxiety among surgical patients: A systematic review and meta-analysis. International Journal of Surgery Open. 2020;25:6-16. doi:10.1016/j.ijso.2020.05.010
5. Ni K, Zhu J, Ma Z. Preoperative anxiety and postoperative adverse events: A narrative overview - anesthesiology and Perioperative Science. SpringerLink. July 17, 2023. Accessed September 6, 2023. https://link.springer.com/article/10.1007/s44254-023-00019-1.
6. Jeon S, Lee HJ, Do W, et al. Randomized controlled trial assessing the effectiveness of midazolam premedication as an anxiolytic, analgesic, sedative, and hemodynamic stabilizer. Medicine (Baltimore). 2018;97(35):e12187. doi:10.1097/MD.0000000000012187

FIU FLORIDA INTERNATIONAL UNIVERSITY

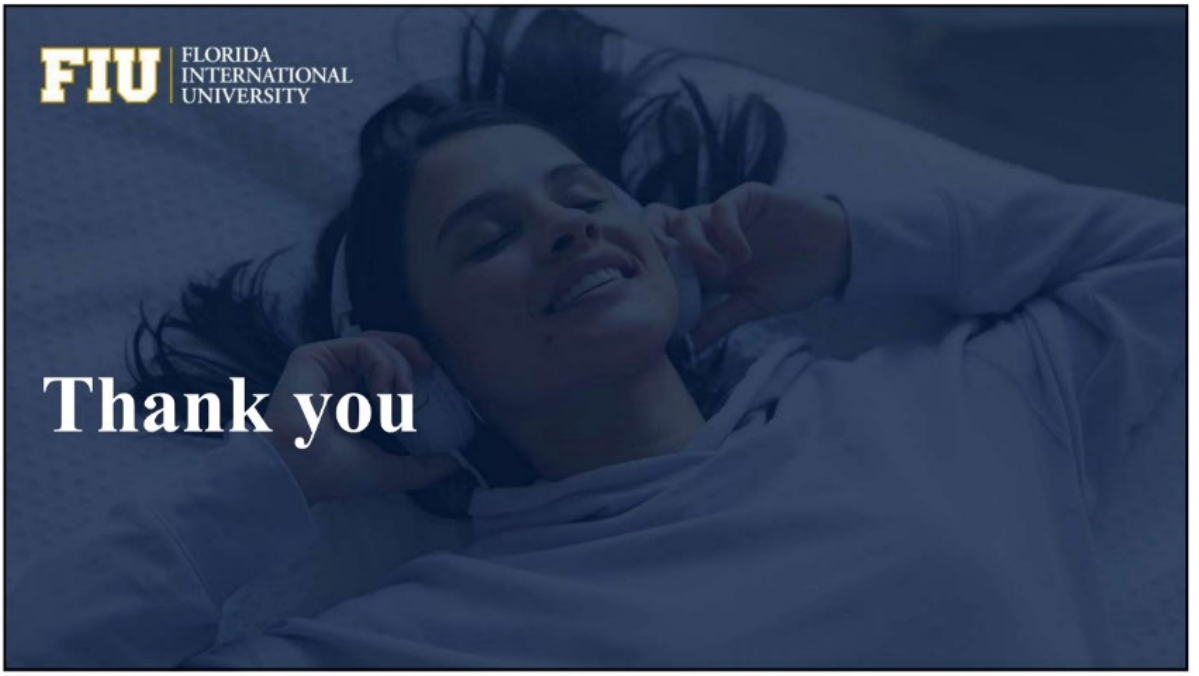
19

References (2/2)

7. Prasad M, Sethi P, Kumari K, et al. Comparison of Binaural Tone Music vs Patient Choice Music vs Midazolam on Perioperative Anxiety in Patients Posted for Surgery Under Spinal Anaesthesia: a Randomized Control Trial. Cureus. 2023;15(2):e35091. Published 2023 Feb 17. doi:10.7759/cureus.35091
8. Giordano F, Giglio M, Sorrentino I, et al. Effect of Preoperative Music Therapy Versus Intravenous Midazolam on Anxiety, Sedation and Stress in Stomatology Surgery: A Randomized Controlled Study. J Clin Med. 2023;12(9):3215. Published 2023 April 29. doi:10.3390/jcm12093215
9. Kühlmann AYR, de Rooij A, Kroese LF, et al. Meta-analysis evaluating music interventions for anxiety and pain in surgery. Br J Surg. 2018;105(7):773-783. doi:10.1002/bjs.10853
10. Uğraş GA, Yıldırım G, Yüksel S, et al. The effect of different types of music on patients' preoperative anxiety: A randomized controlled trial. Complement Ther Clin Pract. 2018;31:158-163. doi:10.1016/j.ctcp.2018.02.012
11. Oyur Çelik G, Güzelçiçek A, Çelik S. The Effects of Music Therapy on Patients With Coronary Artery Disease Before the Invasive Procedure: A Randomized Controlled Study. J Perianesth Nurs. 2022;37(2):194-198. doi:10.1016/j.jopan.2021.01.010
12. Lee HY, Nam ES, Chai GJ, Kim DM. Benefits of Music Intervention on Anxiety, Pain, and Physiologic Response in Adults Undergoing Surgery: A Systematic Review and Meta- analysis. Asian Nurs Res (Korean Soc Nurs Sci). 2023;17(3):138-149. doi:10.1016/j.anr.2023.05.002

FIU FLORIDA INTERNATIONAL UNIVERSITY

20



21