The Impact of Perioperative Music on Pain and Anxiety Management in Surgical Patients: A Quality Improvement Project

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By
Kolton Harris BSN, RN

Supervised By

Christina Vera PhD, DNP, CRNA, APRN

Approval Acknowledged: Ann B. Miller, DNP, CRNA, APRN, FAANA, DNA Program Chair

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Abstract

Background: Pain and anxiety are major challenges that adult surgical patients experience during the perioperative period of surgery. Currently, treatment options for pain and anxiety heavily rely on pharmacological interventions like opioids and benzodiazepines. These medications are effective at treating these issues, but they are also associated with multiple adverse effects, including dependency and delayed recovery. The ongoing opioid crisis in the United States shows that there is a need for safe, non-pharmacological treatment options. Music therapy is a cost-effective, non-invasive, and safe intervention that has showed potential to complement the traditional treatments. Research indicates that music therapy can decrease pain perception, anxiety levels, and improve physiological measurements, but music therapy remains underutilized.

Methods: This project uses an educational module for Certified Registered Nurse Anesthetists (CRNAs) to help them understand the benefits of using music therapy in the perioperative setting. A pre-/post-intervention assessed the CRNAs knowledge about music therapy and its benefits. Participants completed a pre-test, then reviewed the evidence-based educational module, and completed a post-test to measure knowledge on music therapy and attitude in adopting change. Descriptive and inferential statistics analyzed pre-/post-test results to determine the educational modules impact. Key metrics include self-reported changes in understanding, perceptions of music therapy, and its feasibility.

Results: Ten CRNAs with different backgrounds and years of experience completed the pre-test, educational module, and the post-test. The post-test results showed a measurable increase in the CRNAs' knowledge about music therapy's effects on pain, anxiety, and hemodynamic stability. The number of participants who reported being "most likely" to use music therapy in their practice increased from 40% to 70% post-intervention.

Conclusion: The educational module effectively increased CRNAs' knowledge and the likelihood of using music therapy during the perioperative period. Music therapy presents a low-cost, non-invasive, and feasible treatment option to enhance multimodal analgesia treatment, improve patient outcomes, and reduce reliance on pharmacologic interventions to treat pain and anxiety. Incorporating music therapy into anesthesia care could contribute to safer, more holistic perioperative management of adult surgical patients.

Keywords: *music therapy, non-pharmacological pain management, non-pharmacological anxiety management, adult surgical patients.*

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Introduction

Surgery causes significant pain and anxiety, and pain is often a reason why surgery is being performed. Pain and anxiety are often treated with pharmacological interventions such as opioids and benzodiazepines. These medications are very effective but carry some serious risks, which include adverse side effects, delayed recovery, and dependence.[1,2,3] The United States is currently in an opioid crisis, which is affecting millions of people and the healthcare system.[2] Due to this ongoing problem, many anesthesia providers have tried to find ways to decrease the amount of opioids given to patients. By using a multimodal approach to treat pain and anxiety with; opioids, benzodiazepines, non-opioid, and non-pharmacological treatments, pain, and anxiety can be effectively managed, and decrease the number of opioids and benzodiazepines a patient may need to receive. Music therapy is used to complement pain and anxiety management protocols.[1,2,3] Despite the benefits and potential of music therapy, it remains underutilized in the clinical setting.[1] This quality Improvement Project aims to evaluate the impact of perioperative music on pain and anxiety levels in adult surgical patients and assess the potential of reducing reliance on pharmacological agents.

Music therapy is an appealing non-pharmacological intervention that can be used to help treat perioperative pain and anxiety. Due to it being cost-effective, non-invasive, and can be used on most patients, music therapy has very minimal negative side effects.[1,2,3] This Quality Improvement Project supports the use and efficacy of music to lower pain and anxiety levels in the perioperative period of patients undergoing surgery. There is currently an opioid crisis in the United States, using a multimodal approach to treating pain and anxiety can lead to a reduction in the amount of opioids and sedatives the surgical patient may require.[1,2,3]

When pain and anxiety levels are not adequately controlled, the patient can have a prolonged hospital stay, with increased healthcare costs, potential adverse effects on patient outcomes, and decreased satisfaction scores.[1] The current practice for treating pain is opioids and non-opioid analgesic medications, and for the treatment of anxiety, the patient receives a benzodiazepine. These medications are effective but have a long list of adverse side effects, such as respiratory depression, constipation, nausea and vomiting, addiction, and emergence delerium.[1] When anesthesia providers have more non-pharmacological options, to treat pain and anxiety this will decrease opioid and benzodiazepine utilization.,

PICO Question

In adult surgical patients, P, does music therapy in the perioperative period, I, compared to opiates and benzodiazepines, C, increase provider knowledge and attitude in decreasing pain and anxiety levels, O, increase patient satisfaction and decrease PACU stay?

Population- Surgical patients

Intervention- Music therapy

Comparison- Opiates and benzodiazepines

Outcomes- Decrease pain and anxiety levels

Purpose Statement

Pain and anxiety levels are often elevated both preoperatively and postoperatively. It is imperative for anesthesia providers to control patients' pain and anxiety to improve the patient experience and satisfaction. Traditional treatment of pain includes opioid and non-opioid analgesic medications, and treatment for anxiety is often benzodiazepines.[1] Opioid and benzodiazepine medications often have harsh side effects and a risk of addiction.[1] Anesthesia providers often try to limit the amount of these medications. If the patient's pain and anxiety are

not well managed, it can lead to prolonged hospital stays, decreased patient satisfaction, and have a negative impact on patient outcomes and patient satisfaction.[1]

Non-pharmacological therapies are not commonplace for managing pain and anxiety in the perioperative period. Music therapy is an inexpensive and safe adjunctive therapy that can be added to a patient's treatment option.[1] Music therapy has minimal side effects and can be used on most patients.[1] It is important for anesthesia providers to be able to control surgical patients' pain and anxiety in the safest and most effective way possible and will have a positive impact on the patient's overall experience and outcomes.

Problem Identification

The current treatment for managing pain and anxiety in surgical patients relies heavily on medications such as opioids and benzodiazepines.[2] These medications are effective at reducing pain and anxiety levels, but also have potential side effects like respiratory depression, nausea, constipation, and delirium.[1] Long-term use of opioids can lead to addiction and dependence, contributing to the ongoing opioid crisis in the United States.[1] The current opioid crisis in the United States has emphasized the serious need for safer, alternative options for pain management, especially since these medications can have severe consequences with misuse and abuse. With these medications having such negative side effects, anesthesia providers tryto decrease the amount of opioids that are given to the patient by using non-opioid analgesic medications, peripheral nerve blocks, and non-pharmacological interventions.[1] While non-opioid analgesic medications and peripheral nerve blocks are becoming more common, non-pharmacological interventions, such as music therapy, have yet to become commonplace.[2]

Pain and anxiety need to be adequately controlled; if uncontrolled patients may experience delayed healing, more extended hospital stays, higher healthcare costs, and decreased

patient satisfaction.[1] The side effects of opioids and benzodiazepines also lead to these unwanted events.[1] Anesthesia providers need to find a balanced approach to pain and anxiety treatment that limits the use of opioids and anxiolytics. Using these medications, as well as being combined with other treatments like music therapy may help control patients' pain and anxiety levels, decrease the use of the medications and provide a safer and more holistic approach to treating surgical patients' pain and anxiety.[1] Doing so can help improve patient outcomes, increase patient satisfaction, and help combat the opioid crisis going on in the United States.[2]

Background

Pain and anxiety levels play an important role in a patient's experience during surgery. Pain and anxiety levels increase many physiological factors like heart rate, blood pressure, respiratory rate, and cortisol levels.[3] If these parameters are not controlled and left untreated, these physiological responses can cause severe complications of their own, such as increased bleeding during the surgery, stroke, and myocardial infarction. Postoperatively, if the pain is not adequately controlled, it can decrease the patient’s mobility, delay wound healing and increase the likelihood of chronic pain syndromes.[2] Given these risks, anesthesia providers are always searching for ways to better control patient's pain and anxiety levels while limiting the use of opioids and anxiolytics.

Music therapy offers the patient a non-invasive, non-pharmacological, cost-effective, and risk-free approach to help decrease both pain and anxiety levels.[2] Music therapy has been shown to decrease pain and anxiety levels by distracting the patient, altering their mood, and affecting the autonomic nervous system.[4] Research has shown that music therapy can influence the dopaminergic and endogenous opioid systems to reduce pain perception and anxiety.[2,4] The use of music therapy in the perioperative period remains underutilized. Greater awareness and

understanding of the benefits of music therapy, especially in reducing the patients' pharmacologic requirements, are essential for the broader use of music therapy. There is still a need for further research and a clearer implementation framework to encourage the widespread use of music therapy in the perioperative care setting for surgical patients.[1]

Scope of the Problem

Each year, over 310 million surgeries are performed worldwide, with 40 to 50 million surgeries occurring in the United States alone.[5] Surgery is painful, so the majority of these surgical patients are given an opioid during the surgery and are prescribed an opioid to take after surgery. Surgery is also anxiety-provoking, so many patients are given a benzodiazepine to decrease stress. Patients are not usually prescribed a benzodiazepine to take after surgery, but benzodiazepines still have their problems. Research has shown that 60-80% of surgical patients reported having preoperative anxiety that has contributed to delayed recovery and decreased satisfaction scores.[4]

In 2022, there were 73,838 opioid overdose deaths in the US, and 10,964 people died from a benzodiazepine overdose.[6] There is an overreliance on opioids for pain management, which is furthering the opioid problem in the United States. The financial burden of opioid misuse is astonishing, with the cost of treatment of opioid-related side effects and overdoses estimated to be over $78 billion annually in the United States alone.[2] Adverse events related to benzodiazepine use also contribute to increased healthcare costs, as patients may experience delayed recovery or need additional treatment to address the side effects.[2]

Despite the side effects and increased costs associated with opioid and benzodiazepine use, non-pharmacological treatments are still underutilized in clinical practice. Music therapy is a simple and inexpensive intervention that can help reduce the use of these medications, decrease

healthcare costs, and improve overall patient outcomes.[1] By including music therapy in standard surgical care, anesthesia providers could potentially reduce the frequency and dosage of opioids and benzodiazepines, which could, in turn, alleviate some of the risks and financial costs associated with these medications.[2] Research has also shown that when music therapy is included in patient care, it has significantly improved hemodynamic parameters like blood pressure and heart rate, which helps reduce physiological stress on the patient.[7] Music therapy also has the potential to improve patient satisfaction scores by offering a more personalized, holistic, non-invasive intervention that can improve their surgical experience.[2] Knowing that pharmacological use can increase healthcare costs and lead to dependency, implementing music therapy could have profound benefits for patients and the healthcare system.

Consequences of the Problem

Failing to address the excessive use of opioids and anxiolytics in the perioperative period may have long-lasting consequences for patients and the healthcare system. If excessive medication use is not addressed, patients will continue to be at risk of adverse drug reactions, prolonged recovery, and dependency.[1] The use of opioids, abuse, and overdose cost the United States over $78 billion.[1] If not addressed, the overuse of opioids will continue to drive the opioid crisis and overdose deaths in the United States, increase hospital readmissions, and raise healthcare costs.[1] The economic impact of opioid misuse and abuse is over $78 billion in direct costs, and opioid dependence, and overdoses contribute to lost productivity and increased demands on social services.[2,6]

In many cases, patients who become reliant on opioids after surgery continue to have health complications that require additional medical interventions, which can increase stress on the patient, their family, and healthcare resources.[2] Failing to adequately manage patients' pain

and anxiety also has its consequences, such as delayed wound healing, decreased mobility, and the development of chronic pain syndromes.[1] Inadequately managed pain and anxiety can also lead to increased rates of postoperative complications, readmissions, and extended hospital stays, all of which contribute to higher healthcare costs and decreased patient satisfaction.[1] The healthcare system may be responsible for the financial consequences of more extended hospital stays, increased use of resources, and the higher treatment costs associated with the use and side effects of opioids and benzodiazepines.[1] Finding a solution that can effectively reduce the use of these medications without compromising patient care, safety, and outcomes is imperative. By exploring alternative treatment options for pain and anxiety, such as music therapy, the healthcare system can work towards alleviating these long-term effects and provide safer and more cost-effective care.[4] This can also increase patient satisfaction scores and better patient outcomes and experiences.[4,8]

Knowledge Gaps

Despite the growing body of research on the positive effect of music therapy, several knowledge gaps remain, especially in its role in the perioperative care of the surgical patient. There is very little understanding of the specific effects of music on the need for pain and anxiety medications in the perioperative period.[1] There is limited research on whether specific types of music or the timing of the music in the perioperative setting influences the outcomes.[1,3] Research is still needed to understand whether music therapy is cost effective at reducing pain and anxiety if it is played during the preoperative, intraoperative, or postoperative stage of surgery.[4] Patient characteristics such as age, gender, ethnicity, and the type of surgery need to be further researched to identify any differences in the effectiveness of music therapy on decreasing pain and anxiety levels in surgical patients.[1,2,4,8] Further information is also needed to identify

institutional barriers to implementing music therapy in the perioperative setting.[1] Kavak et al. emphasized the use of patient-preferred music but also note that more research needs to be done to compare the effectiveness with clinician-selected music.[4] Future research should also focus on the impact of music therapy on long-term effects.[7]

Addressing these different knowledge gaps will help develop evidence-based recommendations that healthcare providers can use in clinical practice. Addressing these knowledge gaps can also help anesthesia providers better understand the full potential of music therapy that can be used to better patient outcomes. These recommendations may be able to help decrease the use of opioid and anxiolytic medication and provide some relief to the ongoing opioid crisis in the United States.[2]

Proposed Solution

The current treatment for pain and anxiety is pharmacological interventions, mainly opioids, and benzodiazepines, respectively which have side effects as previously mentioned. The proposed solution of including non-pharmacological treatments in surgical patient care, such as music therapy, is often underutilized.[1] Using music in patient care would involve allowing patients to select their favorite music to listen to during different perioperative stages to help decrease pain and anxiety.[2,4] Listening to music in 30-minute sessions in the postoperative period can drastically decrease pain levels in surgical patients, making it a reasonable and effective intervention. Music therapy can also be used in the preoperative period; it can effectively reduce preoperative anxiety, especially when the music is personalized to the patient's liking.[4]

This research project aims to examine the effects of playing music during the perioperative period on reducing the need for pain and anxiety medications. The intervention involves playing music during the perioperative period to assess whether or not this leads to a

decrease in the need for pharmacological intervention to manage surgical patients' pain and anxiety. Conducting this research will provide valuable information on the effectiveness of using music therapy as a non-invasive, safe, and cost-effective adjunct to traditional pain and anxiety treatments. The goal of this Quality Improvement QI, Project was to educate anesthesia providers on the benefits of music therapy and their attitude in practice change for improved pain and anxiety while decreasing pharmacological medications. The findings of this project will provide guidance on how to use music therapy in the clinical setting to provide the patient with safe, effective, and patient-centered care.

To implement the intervention of music therapy in surgical patients' perioperative care, anesthesia providers could receive training on how to support and encourage patients to use music as part of their pain and anxiety management treatment.[1] Measuring patient's pain and anxiety scores, medication use, and patient satisfaction scores helps determine the effectiveness of using music as an added treatment to surgical patients' regimens. This information helped demonstrate the benefits of music therapy, furthering the discussion for its addition into clinical practice and helping combat the challenges that are posed by opioid and anxiolytic use in surgical patients.

Developing an educational module for anesthesia providers that focused on the issue of pain and anxiety in surgical patients in the perioperative period and how music therapy can be a beneficial adjunctive treatment can be an effective way to address the knowledge gaps and create awareness that music therapy is useful in surgical patients. This education module provided information on using patient-selected music, the effects on hemodynamic measurements, possible decrease in medication use for pain and anxiety levels before and after the intervention.[4,8] There was a pre and post assessment to test the knowledge of the anesthesia

provider before and after the educational module.. The pre and posttest also assessed the perceptions/attitude of the CRNAs towards music therapy.

Literature Search Strategy

Two databases were utilized to obtain articles on music therapy played during the perioperative period. PubMed and CINAHL electronic databases were utilized for this search of systematic reviews. A Boolean search was done using the operators AND/OR to help limit and expand the search. Keywords that were used included music therapy, surgical patients, and pain and anxiety levels. Using the search strategy of (music therapy or music intervention or musical therapy) AND surgical patients AND (pain management or pain relief or pain control or pain reduction) AND (anxiety treatment or intervention or therapy) AND (randomized controlled trials or rct or randomized control trials) helped find the articles that are being utilized. These two databases provided an extensive list of systematic reviews. This strategy resulted in 127 total articles from the two different databases. There were 55 articles from the CINHAL database and 72 articles from the PubMed database. These articles were exported to EndNote, where 21 duplicate articles were found. Fifty article abstracts were then reviewed by the author to determine if they should be used in this literature review. The abstract of the articles was read to identify articles that met the requirements, and then once the articles were usable, they were read to identify the research findings.

The articles found that music therapy in the perioperative period helped reduce anxiety and pain levels.[1,2,4] The articles agreed that music is a safe and effective non-pharmacological therapy that can be used as an adjuvant to pharmacological therapy.[1,2,3] It was also found that music therapy helps regulate hemodynamic measures such as blood pressure and heart rate.[2] Music therapy can also help increase patient satisfaction scores.[2] One article found that music

therapy decreased narcotic use by 26%.[3] Music therapy is a safe and cost-effective tool that can easily be used on any patient and compliments pharmacological treatments for pain and anxiety.[1,2,3]

The articles all agreed that pain and anxiety levels were decreased when music was used.[1,2,3] Limitations in the research showed physiological parameters such as blood pressure and heart rate are inconsistent.[2,3] This suggests that more studies are needed to determine the effect of music on these physiological factors. The studies are also inconsistent in the type of surgery, type of music, and the duration of the music being played.[1,2,3] A study on the impact of music therapy during the perioperative period that looks at various types of surgeries could help produce more consistent results. With more consistent results, it could provide guidance on standardizing music interventions in surgical patients as an adjuvant to pain and anxiety treatments.

Inclusion and Exclusion Criteria

Inclusion criteria in this review needed to include patients undergoing surgery, and published between 2019 and 2024. The articles had to be a randomized control study (RCT), which is level II evidence according to the Johns Hopkins tool of evidence.[9] The articles must have been in full text and written in the English language. The included articles had to provide measurable outcomes; which allows for the variables to be compared to one another. The remaining articles were excluded due to their inadequate detail, limited information, irrelevant information, outdated information, and a moderate to high risk of bias. Ultimately, ten randomized control trials were selected to be included based on the inclusion and exclusion criteria. The RCTs that were chosen were critiqued using the American Nurse Association Framework.[10]

Results of Included Studies

Laframboise-Otto et al. explored how effective music is as an adjuvant to analgesic medication and if it reduces postoperative pain in patients undergoing knee or hip arthroplasty surgery.[1] This study is important because arthroplasty surgery is associated with high levels of postoperative pain. Pharmacological treatment is the standard of care for treating pain, but their harsh side effects have increased the need for other treatments to help decrease the amount of these medications that are needed.[1]

This level II randomized controlled trial had 50 participants who were divided into two groups.[1] Group one ,music group, listened to music for 30 minutes, three times per day postoperatively, in addition to receiving analgesic medications.[1] Group two ,control group, did not listen to music but received normal care, which includes opioid medications.[1] Both groups rated their pain level using a numerical rating scale, and they self-reported their use of pain medication.[1] The music group reported significantly lower pain levels on postoperative days one and two.[1] However, there were no statistically significant differences in the use of opioid medication between the groups, which means that music therapy did not decrease the need for pain medication.[1] This suggests that music therapy may reduce the perception of pain, but it may not be sufficient enough to decrease medication requirements.[1]

This randomized control trial conducted by Mishra et al. researched the impact of music therapy on pain and anxiety levels in male patients undergoing robotic-assisted laparoscopic prostatectomy.[2] The study assessed whether music therapy is effective at reducing postoperative pain and anxiety levels.[2] The participants were divided into two groups. Group one, music group, listened to music for 30 minutes in the recovery area after surgery and again on postoperative day one.[2] Group two, control group, did not listen to music.[2] The researchers measured

postoperative narcotic use using morphine milligram equivalents and anxiety levels with the State-Trait Anxiety Inventory (STAI).[2] The researchers found that the music group used 26% fewer opioids post-hospitalization. There was no difference between the two groups and their STAI scores on postoperative day one or day seven.[2]

Mishra et al. is a randomized control study that provides level II evidence.[2] Randomized control trials provide strong evidence because they have the ability to minimize bias by placing the participants in groups randomly. The small sample size of this study may limit the generalizability of the findings. The small sample size may also have contributed to the lack of significant findings regarding anxiety levels.[2] The research showed that music therapy in the perioperative period can reduce opioid use in the postoperative period.[2] This finding is consistent with prior research, which shows that music therapy can decrease opioid consumption in the postoperative period.[2]

Kavak Akelma et al. conducted a level II randomized control study that focused on having the patient listen to their favorite music and the impact it has on postoperative pain and anxiety levels in adult patients undergoing elective inguinal hernia surgery.[4] There were 117 participants that were unintentionally separated into two groups: the first group listened to their preferred music for 15 minutes in the preoperative period, and the second group received typical care without music.[4] The researchers measured pain and anxiety levels, patient satisfaction, and vital signs preoperatively and postoperatively and compared them.[4]

Anxiety scores in the postoperative period were considerably lower in the music group compared to the control group.[4] The difference in anxiety levels between preoperative and postoperative periods was more significant in the music group.[4] There was not a noteworthy change in pain scores between the two groups at any time in the postoperative period.[4] This

implies that music therapy did not affect the patient's postoperative pain.[4] There was a significant decrease in patient's blood pressure, as well as heart rate, in the music group compared to the control group.[4] The music group also had considerably superior patient satisfaction scores.[4] These findings show that listening to favorite music before surgery is an effective, non-invasive treatment option that can be used to diminish preoperative anxiety, reduce hemodynamic measures, and improve patient satisfaction scores.[4]

Gogoularadja et al. performed a randomized control trial that provides level II evidence that looks at the effectiveness of music therapy on reducing pain and anxiety in patients undergoing nasal septal surgery.[11] This randomized control trial includes 59 participants who were undergoing nasal septal surgery.[11] The researchers randomly selected 29 patients to receive music therapy with standard care and 30 patients to receive standard care only.[11] The music group listened to music for 30 minutes twice a day preoperatively and for two days postoperatively.[11] The researchers measured the patient's anxiety and pain levels using the Generalized Anxiety Disorder-7 scale and Visual Analogue Scale (VAS), respectively.[11]

Preoperative and postoperative anxiety levels were considerably lower in the music group.[11] Postoperative pain scores were drastically lower in the participants who received music therapy.[11] The research supports using music therapy as a non-invasive and cost-effective adjunct to standard care for management of pain and anxiety in patients undergoing nasal septal surgery. The research shows that music therapy significantly decreases the need for pain medications and anxiety management.[11] The results of this research study encourage the use of music therapy in perioperative protocols.[11] The research shows that music therapy provides a safe, effective, and evidence-based adjunct for controlling postoperative pain and anxiety.[11]

This research article by Drzymalski et al. looks at the impact of music therapy on the anxiety levels of women who are undergoing elective cesarean delivery.[8] The researchers included 150 participants in their study and randomly put them in three different groups.[8] Group one listened to patient-selected music, group two listened to preselected music, and group three could not listen to any music.[8] The goal of the research was to identify if music could reduce anxiety and pain in the preoperative and postoperative time.[8]

In the preoperative phase, group two showed considerably lower anxiety levels compared to the control group, while group one did not show a difference in anxiety levels[8] During the postoperative time, there was no significant difference between group two and group three; there was also not any major differences in anxiety levels between group one and group three.[8] Group one did not show any significant difference in postoperative pain scores compared to group three.[8] However, group two did show a significant difference in postoperative pain scores compared to group three.[8]

This randomized controlled trial provides level II evidence.[2] The research provides strong evidence that preselected music, especially classical music, can help diminish preoperative anxiety and post-surgery pain in women undergoing cesarean sections.[8] Patient-selected music does not provide the same benefit of lowering preoperative anxiety and postoperative pain as classical music does; this may be due to the wide variety of musical preferences among the patients.[8] This study does have some limitations, including a potential bias because patients and providers knew of the music interventions.[8]

This research article by Cimen et al. examines the influence of music therapy on anxiety and pain in patients having arteriovenous fistula surgery.[7] This level II randomized control trial aims to demonstrate that music therapy can be a non-invasive, cost-effective therapy to reduce

anxiety and pain during arteriovenous fistula surgery.[7] The research involved 55 participants who were on the kidney transplant list and were undergoing surgery for arteriovenous fistula surgery.[7] These participants were divided into two different groups: group one did not listen to music, and group two (music group) listened to music of their choice.[7] The researchers utilized the State-Trait Anxiety Inventory tool to evaluate anxiety levels pre- and post-surgery.[7] To measure the participant's pain levels, the researchers used a visual analog scale to have the participants rate their pain.[7] Hemodynamic parameters such as heart rate, blood pressure, respiratory rate, and oxygen saturation were monitored preoperatively and postoperatively.[7]

The music group had considerably lower anxiety levels in the postoperative period compared to their preoperative levels, while the control group did not have the same results.[7] The patients in the music group also stated their pain was significantly lower postoperatively, compared to the control group.[7] However, postoperative analgesic medication usage did not drastically vary between the groups.[7] Researchers found that post-surgery blood pressure, heart rate, and respiratory rate were considerably lower, and the oxygen saturation was better in the music group.[7] The significant differences between the music group and control group show that music therapy may be used to lessen anxiety, lower pain levels, and positively impact hemodynamic parameters.[7]

Luis et al. studied the effects of live Oud music therapy on pain levels, cortisol levels, and hemodynamic measures in patients undergoing cardiac surgery.[3] Oud music is a type of traditional Middle Eastern music.[3] This small-scale study involved 12 patients who were split into the intervention group and the control group.[3] The intervention group listened to 20-30 minutes of live Oud music before and after surgery, while the control group was not exposed to music.[3] The researchers measured the patient's pain , cortisol levels, and vital signs before and

after music therapy.[3] The researchers found that the music intervention produced significant reductions in postoperative pain scores.[3] Music therapy also significantly lowered the patient's respiratory rate, heart rate, and cortisol levels.[3] The study provides evidence that live music that is tailored to patient preferences may help reduce pain and stress markers in the perioperative period for cardiac surgery patients.[3] The study suggests that music therapy helps in reducing perioperative stress and pain by promoting relaxation and decreasing sympathetic nervous system activity.[3] This randomized control trial produces level II evidence, but the small sample size suggests that more extensive research should be done to verify the results.[3]

Deng et al. researched music therapy alone, aromatherapy alone, and combined aromatherapy and music therapy and the effects on pain and anxiety scores in women with breast cancer undergoing mastectomy surgery.[12] The randomized control trial involved 160 females with breast cancer who were randomized into four groups: the music group, the aromatherapy group, the combined group, and the usual care group.[12] Pain and anxiety were measured before surgery and four hours after extubation.[12] The researchers also measured biomarkers IL-6 and HMGB-1 because they are related to pain and stress responses.[12] The researchers found that the combination therapy group had the least increase in pain postoperatively, while the usual care group had the highest increase in pain.[12] Pain levels in the music therapy group increased by three points on average, compared to a five-point increase in the usual care group.[12] Anxiety levels in all groups decreased significantly besides the usual care group, which showed minimal change in anxiety levels.[12] The usual care group also had the biggest increase in biomarkers associated with stress and inflammation.[12] This research provides level II evidence and supports the use of music and aromatherapy to help decrease pain and anxiety levels in patients with breast cancer undergoing mastectomy.[12]

The research completed by Musa et al. is a RCT that studied slow-tempo music and its effects on anxiety markers in patients undergoing cataract surgery.[13] This randomized control trial provides level II evidence that slow-tempo music can considerably cause decreases in anxiety levels in patients undergoing cataract surgery.[13] The researchers randomly assigned 74 participants into two groups: the music group listened to standardized piano music, and the control group did not listen to music.[13] The researchers measured anxiety levels as well as salivary alpha-amylase, blood pressure, and heart rate.[13] Salivary alpha-amylase, blood pressure, and heart rate are usually elevated when people are experiencing high levels of anxiety. Researchers found there to be a substantial decrease in salivary alpha-amylase levels, blood pressure, and anxiety levels postoperatively.[13] The researchers concluded that slow-tempo music significantly lowers anxiety indicators and suggest that music therapy can serve as an adjunct to help reduce the use of preoperative sedatives.[13] Even with the lack of blinding, this study aligns with previous research that supports the use of music to help alleviate anxiety in surgical patients.

Law et al. explored music's impact on pain management for women undergoing a hysteroscopy.[14] This randomized controlled trial had 107 participants who were randomly assigned into two groups.[14] Group one listened to self-selected music, and the participants in the second group did not listen to any music.[14] The researchers used the visual analog scale to measure the patient's pain, blood pressure and heart rate of the participants.[14] The results showed a major reduction in the pain level of the participants in the music group.[14] There was no differentiation in the heart rate and blood pressure between the groups.[14] This demonstrates that music therapy can be helpful to decrease patients' pain perception and decreases pain levels.[14] The outcomes of this research support the use of music as a simple, cost-effective, harmless, and

non-pharmacological adjunct treatment to help reduce pain in patients undergoing hysteroscopy procedures.[14] The researchers also recommend including music in routine outpatient procedures to enhance patient outcomes and experiences.[14]

Synthesis of Evidence

Laframboise-Otto et al., Law et al., and Luis et al. all researched the impact of music therapy on pain reduction in the postoperative stage. The outcomes from these studies consistently reported that the participants who listened to music experienced lower pain scores when compared to the control groups.[1,3,14] The researchers all determined that music therapy can be used as an effective adjunct to pharmacological therapies to help control patients' pain.[1,3,14] When combined with traditional pain treatment, music therapy has a complementary effect and is a safe and cost-effective intervention. [1,3,14] Although their findings on analgesic-sparing effects vary, they all agree that music played a role in reducing pain in surgical patients.[1,3,14]

Kavak Akelma et al., Drzymalski et al., Gogoularadja et al., and Cimen et al. all focused on reducing anxiety with music therapy in the preoperative and postoperative settings.[4,7,8,11] These studies all found that music therapy consistently reduced preoperative anxiety and stabilized physiological responses like heart rate and blood pressure.[4,7,8,11] The studies showed that music therapy was effective at not only reducing anxiety but also improving the patient's experience as well.[4,7,8,11] These studies all support music as an effective way to help reduce perioperative anxiety, especially in those procedures that do not use general anesthesia.[4,7,8,11] Music therapy was shown to help stabilize physiological parameters like heart rate and blood pressure and could serve as an effective intervention to help patients maintain a calm and stable state throughout the duration of the procedure.[4,7,8,11] Overall, the research agreed that music

therapy is an effective way to help control a patient's anxiety when undergoing a variety of different surgical procedures.[4,7,8,11]

Deng et al. and Luis et al. researched music therapy with additional interventions and their effects on pain and anxiety in surgical patients.[3,12] Deng et al. researched the combination of music and aromatherapy, while Luis et al. researched live Oud music in a culturally specific setting.[3,12] Both showed significant reductions in both pain and anxiety levels in surgical patients.[3,12] The findings from these research articles indicate that when music is combined with other non-pharmacological therapies, it enhances pain and anxiety reduction.[3,12] The use of culturally appropriate music also enhanced patients' comfort level as well as emotional state.[3]

Mishra et al., Musa et al., Luis et al., and Gogoularadja researched the type and timing of music delivery.[2,3,11,13] Mishra found that postoperative music reduced opioid requirements but did not affect the patient's anxiety level.[2] This finding suggests that the timing, type of music, and setting may influence the effectiveness of music therapy. While Musa et al. showed that using slow-tempo music during cataract surgery significantly reduced patients' anxiety levels.[13] Different types of music and the time when music is played may be strategically selected based on the specific outcome that is desired. Intraoperative music helps with decreasing anxiety, while postoperative music has been shown to be able to decrease pain levels and reduce analgesic medication needs.[2,3,11,13] Modifying the music type and delivery could optimize patient outcomes and experience based on the specific needs of the patient.[2,3,11,13]

Music and its Impact on Surgical Patients

A significant topic addressed by this review is whether or not music therapy can drastically reduce pain and anxiety levels of surgical patients. Research indicates that music therapy can significantly reduce patients' pain levels, although there are varying results on its

impact on analgesic medication usage. Mishra et al. found that music therapy decreased opioid usage by 26%, while other articles did not find any difference in the number of opioids consumed.[1,2] Research also consistently supports music therapy for reducing perioperative anxiety. The outcomes of this review advocated that music therapy is a valuable, low-risk, and cost-effective adjunct that can be added to conventional treatment for anxiety management in surgical patients during the perioperative period. When patient's pain and anxiety levels are adequately treated, their satisfaction levels are increased.[8] Offering the patient familiar, calming music before and after surgery can improve the patient's emotional state and may improve the quality of their surgical experience.[3]

Literature Review Conclusion

The evidence that was collected for this review supports the use of music therapy as a non-invasive, safe, and cost-effective non-pharmacological intervention for managing pain and anxiety in surgical patients. However, the degree to which music therapy decreases the need for pharmacological interventions, such as opioids or anxiolytics, remains diverse. Timing, type of music, and delivery method likely cause variations in the effectiveness of music therapy. Despite these differences, the research still consistently suggests that music therapy is a valuable and effective adjunct that can be used in perioperative care. Including music therapy in perioperative protocols could provide an additional safe and effective non-pharmacological method for enhancing patient outcomes and reducing the reliance on pharmacologic therapies.[2,13]

Methodology

Organizational Assessment

This section will cover the significance of non-pharmacological interventions, the implementation strategy involving key stakeholders, and the theoretical framework that is guiding the project. The Strength, Weakness, Opportunities, and Threats (SWOT) analysis and SMART (Specific, Measurable, Achievable, Relevant, and Time-Bound) will provide insights into the goals of the project as well as the strengths and potential barriers to achieving these goals.

Primary DNP Project Goal

The primary purpose of this doctoral project was to identify whether music therapy can effectively reduce surgical patients' pain and anxiety levels in the perioperative period and, therefore, reduce the need for pharmacological interventions to manage pain and anxiety in adult surgical patients. This goal was made by evidence that suggests that music can help patients achieve a more relaxed state, which can potentially decrease the requirement for anxiety of pain medications in the perioperative period. By assessing the patient's pain and anxiety levels, hemodynamic measurements, and other physiological factors before and after surgery, the aim was to determine if music therapy is a feasible and effective treatment that is in alignment with the evidence-based practice for patient-centered care. The primary area of focus that was assessed was the degree to which music therapy can ease surgical patient pain and anxiety levels. The Quality Improvement Project hopes to provide insight that can lead to more holistic approach in perioperative care.

The identified problem at this practice site was the limited use of alternative or adjunct therapies for managing perioperative pain and anxiety. Pharmacological solutions, such as

opioids and benzodiazepines, are currently the standard practice. These medications carry the risk of adverse side effects, increased risk of complications, and prolonged recovery times.[1,2] Evidence from current research shows that music therapy is helpful as a non-pharmacological intervention that can be an adjunct to current treatment plans to increase patients' comfort and reduce the use of medications.[2,11] Music therapy was not routinely used despite the documented advantages, which indicates a gap between current practices and evidence-based approaches to care for surgical patients. Addressing this gap between research and current practice led to an increase in CRNAs knowledge and music therapy and its added benefits that will improve patient and clinical outcomes.[4,7]

One of the initial steps of this project was to determine key stakeholders. Key stakeholders in this project include Certified Registered Nurse Anesthetists (CRNAs), who were directly involved in implementing the music intervention. The success of this project depended on the engagement of the CRNA's, as they were the ones completing the educational module on music therapy and providing crucial insight into its effectiveness and feasibility. The CRNA's engagement was essential for the success of this educational module because they were the ones completeing the pre-test, educational module, and post-test.

SMART Objectives

Specific

The first goal of this project was to determine the effectiveness of music therapy as an added intervention to help treat pain and anxiety levels in the perioperative period of adult surgical patients.

This project's second objective was to increase the CRNAs knowledge of music therapy and increase their desire to use music therapy in their care of the adult surgical patient in the

perioperative period. Implementing music as an adjunct treatment option aims to decrease surgical patients' pain and anxiety levels in the perioperative period.

A third objective of this Quality Improvement project was to assess the attitudes of the CRNAs towards music therapy. The goal was to increase the CRNAs desire to add music therapy into their anesthetic practice to help treat pain and anxiety levels in adult surgical patients.

Measurable

The efficacy of music therapy as a treatment option was measured by assessing the CRNAs knowledge of music therapy via a pretest then a 10-minute Zoom educational module followed by a post-test. The results were gathered and compared the pre and post test results. CRNA compliance with the music therapy intervention will be tracked and recorded, with a goal of 80% adherence. Surveys will be done to assess the CRNAs understanding and their perceived thoughts, knowledge, attitude and benefits of music therapy.

The amount of opioids and anxiolytics used by the surgical patients receiving music therapy will be tracked and compared to those surgical patients that did not receive music therapy. The expectation is for the patients who listened to music will have used less medication than those patients that did not listen to music.

Achievable

These goals were possible because implementing music therapy is very feasible. It is a cost-effective, non-invasive, non-pharmacological, and safe intervention to help anesthesia providers treat pain and anxiety. Medication usage can systematically recorded, so there will be an accurate comparison between the patients who received music therapy and those patients who did not.

Relevant

Reducing and controlling surgical patients' pain and anxiety is crucial to improving the patient's experience and outcomes, which is in line with this project's overall objective to improve perioperative care.

Increasing CRNA's awareness of the ability to use music as an added intervention to help treat pain and anxiety was key to the success of this project. The involvement of CRNAs will directly affect the consistency of the intervention and patient outcomes.

Reducing the amount of opioid and anxiolytic medication that patients have to take helps minimize the harmful side effects. It can also help improve recovery, and it addresses the issue of opioid dependence, a significant problem that is ongoing in the United States.

Time-Bound

This project was concluded within eight months, and it includes information on the effectiveness of music therapy and how to effectively use music to decrease surgical patients' pain and anxiety. This timeframe allowed for the project to be completed in a timely manner and comprehensive evaluation of the information.

Description of the Program Structure

Conducting a baseline organizational needs assessment is the initial step that needed to be taken when establishing the need and potential benefits of using music to help manage pain and anxiety in adult surgical patients. This baseline assessment provided the foundation of evidence for engaging the leaders of the organization and the key stakeholders. It also emphasizes the need for the project and the impact it can have on patient experiences and outcomes. It also stresses the need for alternative, non-pharmacological interventions in the perioperative treatment of pain and anxiety.

The project setting relied on pharmacological methods for managing pain and anxiety in the perioperative period. Benzodiazepines were the drug class of choice that anesthesia providers rely on to treat anxiety, and opioids were used to treat pain in the perioperative period. Relying too heavily on these medications increases the patient's risk of side effects and may prolong the discharge time and recovery time.[4] The high rates of opioid and benzodiazepine usage suggests the need for other alternative effective, non-invasive treatment options that could help reduce medication reliance but still offer safe and patient-centered care in the perioperative period. With a growing focus on patient-centered and holistic care, non-pharmacological treatment options have been increasing in popularity.[4] So, music therapy presents CRNAs with a method to treat pain and anxiety that can enhance patient satisfaction and outcomes and possibly reduce medication usage.[2,7]

To secure the necessary buy-in for this project, it was important to establish partnerships with key stakeholders within the facility. The primary partnership was with the anesthesia department, particularly with the CRNAs who were involved in taking the music therapy educational module and taking the pre and posttests. Their insight was valuable information to determine if they were interested in using music therapy as an added therapy for their patients to help treat and control pain and anxiety.

Organizational SWOT Analysis

Using the SWOT, Strengths, Weaknesses, Opportunities, and Threats, analysis was a valuable tool that helped evaluate the factors influencing the implementation of evidence-based practices. The SWOT analysis helped identify the organization's strengths and weaknesses and the threats to applying the intervention into practice. Applying the SWOT analysis helped transform research into clinical practice by identifying the different areas in which the standard

of care needed to be elevated. This section will identify the strengths, weaknesses, opportunities, and threats that may be associated with using music therapy as an adjunct intervention to reduce pain and anxiety in adult surgical patients.

Strengths

One of the main strengths was the commitment to improving surgical patients' experience by better controlling their pain and anxiety levels in the perioperative period. The primary goal of this project was to improve CRNA knowledge on music therapy and their desire to improve patient care and outcomes by providing a safe and effective treatment option for pain and anxiety. Music therapy is cost-effective and non-invasive, which makes it an attractive option for patients, healthcare organizations, and anesthesia providers.[7] It is also an option that can be easily incorporated into current perioperative care protocols.[7,11]

Weaknesses

Despite the strengths, weaknesses may deter the incorporation of music therapy. A significant weakness of research on music therapy is the inability to blind the participants.[8,12] Another weakness is the lack of confidence and resistance to new methods among staff, which can lead to music not being consistently used.[2] Lack of follow-up on the long-term effects of the education provided another weakness that was recognized during the SWOT analysis.[3,4] A notable weakness was the lack of standardized protocols when CRNAs want to include music into their care regimen.

Opportunities

There are many opportunities to improve patient care and outcomes when it comes to surgical patients. Music therapy gives CRNAs the opportunity to treat patients' pain and anxiety with a non-pharmacological intervention. Research shows that when patients have the

opportunity to choose their preferred music, the effectiveness of the music intervention increases and gives them a sense of control.[2,4,8] When patients have a sense of control, their engagement and compliance with postoperative instructions are boosted.[2] The ongoing opioid crisis in the United States has given non-pharmacological interventions the opportunity to become used more commonly.

Threats

The implementation of music therapy faces several external and internal threats. Even though the evidence supports the use of music therapy, if the staff is inexperienced with using music, they may be more hesitant to include music therapy in their care of surgical patients.[2] There also may be an initial investment to purchase the necessary equipment like music players and headphones. The facility may be uncertain if they do not want to make the initial investment, which would derail the whole project. There are some variabilities in the research on the effects of music therapy on pain anxiety.[2,3,14] These inconsistencies can raise doubt in the eyes of the stakeholders and deter their commitment to the project. Overcoming these challenges is vital to the success of this project and to improving the perioperative care of surgical patients.

Conceptual Underpinning and Theoretical Framework

The use of theoretical frameworks in nursing research and practice is necessary for structuring studies, guiding interventions, and ensuring consistent outcomes in clinical practice. Using a conceptual framework guides the research of complex problems and create relationships between the problems.[15] These frameworks help create the foundation of research and help researchers draw meaningful conclusions and apply in practice.[15] This project used the Donabedian Model because it is highly relevant to developing healthcare outcomes and quality improvement.[15] The Donabedian Model has three main components: structure, process, and

outcome.[15] This framework applies to music therapy in the perioperative period because the intervention can affect the outcome of the patient. Using this theoretical framework to assess the effectiveness of music therapy in the perioperative period aims to increase the knowledge and attitude of CRNAs regarding the use of music therapy in the perioperative care of surgical patients.

Theory Overview

The Donabedian Model was developed by Avedis Donabedian in the 1960s and is an important framework to help evaluate healthcare quality and also improve patient outcomes.[15] The Donabedian Model provides a method for assessing the different aspects of healthcare delivery and their impact on patient care.[15] Structure refers to the setting in which healthcare services are delivered and can include healthcare facilities, equipment, human resources, and organizational characteristics.[15] Structural characteristics serve as the foundation for healthcare practices and are fundamental in determining the quality of care patients receive. For the context of this project, structure includes the use of sound equipment, the hospital setting, the training and expertise of the CRNAs, and the policies supporting non-pharmacological interventions.

Process describes the actual delivery of healthcare services and focuses on how the care is provided.[15] It not only includes the technical part of how healthcare is delivered but also if evidence has been applied to the decision-making.[16] The process also values the practitioner-patient interaction and involves clinical procedures, treatments, and adhering to established protocols.[16] This project's process refers to using music therapy in the perioperative care of surgical patients. The timing of intervention and staff involvement are also included in the process portion of the Donabedian Model. In the Donabedian Model, a good structure leads to a good process, and a good process leads to good outcomes.[15]

Outcomes refer to the results of the healthcare services/interventions and reflect the impact of the structure and process on patient health.[15] The outcomes may be the immediate results or the long-term effects, which can be patient satisfaction, symptom relief, recovery rates, or a decreased amount of medication needed.[16] The outcomes of this project include the pain and anxiety levels that are reported by surgical patients after listening to music in the perioperative period.

Theory/Clinical Fit

Applying the Donabedian Framework to this project on music therapy provides an organized approach to evaluate the impact that music has on surgical patient's pain and anxiety levels. The Donabedian Framework is clinically relevant because it is commonly used in healthcare research to assess the quality of care and to help improve clinical practices.[16] It provides researchers with a systematic approach to assessing current practices and focuses on areas that need to be improved.[16] Treatment for perioperative pain and anxiety relies heavily on medications; while these medications are effective, they have several problems. This framework is straightforward; the structure, process, and outcome model make it applicable to studies that evaluate both clinical and non-clinical interventions.[16] Music therapy supports the Donabedian Framework because it requires supportive structures, clear processes for implementing the intervention, and measurable outcomes to assess the effectiveness of the intervention.

The Donabedian Framework puts the focus on patient-centered care and can help improve patient outcomes.[16] This project aligns with the focus of patient-centered care by optimizing the treatment of pain and anxiety in the perioperative period. Providing music as an adjunctive treatment allows for a more holistic and non-pharmacological method and can decrease the amount of medication that is needed.[2] By associating outcomes to both the

structural and process elements, the Donabedian Framework aids the comprehensive analysis of how music therapy contributes to overall patient well-being.

Using the Person and Bredow framework helps to evaluate the Donabedian Framework as the theoretical foundation of this project.[17]

The Donabedian Framework's definition of healthcare quality through structure, process, and outcomes is consistent with this DNP project's goal.[16] The goal of this project was to increase CRNAs knowledge on music therapy to help improve the quality of healthcare through managing surgical patients' pain and anxiety with the non-pharmacological method of music therapy. It was expected that the CRNAs who completed the educational module would be more willing to use music therapy in their practice to help decrease patients' pain and anxiety in the surgical patient's perioperative period. The Donabedian model focuses on assessing each component individually and then as a whole to ensure that the relationship between the perioperative environment, the implementation of music therapy, and patient outcomes are systematically examined.[16,17]

The Donabedian Framework is commonly used in nursing and healthcare research, but it is not specific to nursing.[16] The framework has been used to evaluate and improve many different healthcare interventions, from clinical procedures to non-pharmacological therapy.[16] This highlights its ability to be used in assessing the quality of care delivered by nurses and other healthcare professionals.[16]

The Donabedian Framework is adaptable and can be used in an assortment of different healthcare settings and populations.[15] The focus on structure, process, and outcomes is appropriate for the perioperative setting and the adult surgical patient population. The model is appealing because of its flexibility, which allows it to be applied in various settings.[15] This makes

it fit for investigating how different structural and process variables affect the outcomes of music therapy in surgical patients.

The framework does support the development of a testable hypothesis, such as patients that are exposed to music therapy during the perioperative period will report lower pain and anxiety levels compared to those patients who are not exposed to music therapy. The hypotheses that are created through the Donabedian Framework can be tested through methodical research and connect the structure and process to the outcomes.

Several variables in this project can be linked with the concepts of the Donabedian Framework. For example, structural variables include having the necessary resources, equipment, and training CRNAs to provide music therapy. Timing and delivery of music to the patient are included in process variables. Outcome variables include pain and anxiety levels, hemodynamic measures, and medication usage after the intervention and postoperatively. By examining the variables of this project, one can identify which structural and process factors most significantly impact patient outcomes.

The Donabedian Framework has been validated through extensive use for research in healthcare.[16] A large number of studies have effectively demonstrated the use of the Donabedian model in evaluating interventions and improving patient care and outcomes.[16] The Donabedian Framework is credible and is applicable to this project on music therapy in the perioperative period in surgical patients.

Conclusion of Theory Evaluation

Through comprehensive organizational assessment and application of the Donabedian Framework, the feasibility of music therapy was examined. This project focuses on introducing evidence-based and patient-centered care through music to help lower surgical patients' pain and

anxiety levels during the perioperative period. An in-depth understanding of the SWOT analysis is important for successfully adding music therapy to patient care. Addressing gaps in current practices could lead to better patient outcomes, reduced reliance on medication, and a more holistic approach to surgical patient care. The Donabedian Framework increased the strength of this project's theoretical framework and ensured a comprehensive approach to assessing the effectiveness of the intervention. While there are challenges, the potential benefits for patient outcomes highlight its value as an adjunct to current perioperative care practices.

Setting and Participants

This DNP project was conducted in a large, level one trauma center that serves a very diverse community in South Florida. This facility performs various surgeries, such as general surgery, orthopedics, obstetrics, and cardiovascular procedures. The hospital's patient demographic included people from various socioeconomic and cultural backgrounds. This diversity provided a area for assessing the efficacy of perioperative interventions like music therapy. This setting is a suitable place for implementing new interventions due to the high volume of surgical cases and the presence of experienced anesthesia staff who can effectively manage and monitor the process.

The participants in this project were Certified Registered Nurse Anesthetists (CRNAs) employed by the hospital. CRNAs are highly trained and skilled anesthesia providers who play an important role in managing surgical patients' perioperative care. The participation of CRNAs was crucial for the success of this project. The CRNAs who participated increased their knowledge and attitude about the benefits of using music therapy in the perioperative period for surgical patients.

This Quality Improvement Project faced several barriers. In order for the surveys and education module to be completed, the CRNA's had to be emailed several times. It was important to keep the participants anonymous to reduce the risk of bias. The completion of the surveys and educational module took around 20-30 minutes, so it took time away from the CRNA's day which may have made some of the CRNA's not want to participate. There was a potential for resistance to change from CRNAs and staff members.

Procedures

This DNP project used a pre-/post-intervention design to evaluate the knowledge of CRNAs about the benefits of music and its effects on pain and anxiety levels in adult patients undergoing a surgical procedure. The CRNAs took the pre-test and then watched the educational module on music therapy in the perioperative period. The CRNA's then take a post-test to assess the knowledge that they gained from the information that was be presented. This approach is validated in the literature for its ability to measure the impact of non-pharmacological interventions on patient-reported outcomes like pain and anxiety.[9] This design is rooted in evidence that is supportive of educational programs that aim to improve healthcare delivery and patient outcomes.[9]

Participant Recruitment and Protection of Human Subjects

This project was designed to engage CRNAs in an educational initiative to improve patient care during the perioperative period. To recruit CRNAs to participate in this Quality Improvement Project, personalized email invitations were sent, along with other educational materials that helped clarify the project's goals and expectations. It also included the role of the CRNA and the significance of their participation when they decided to participate in the project. It was expected for the CRNAs to have different experience levels and backgrounds. Their

participation was completely anonymous and confidential, and their responses could not be traced back. Participants were fully informed of the project's purpose and goals. Their participation was entirely voluntary.

Approval from the Florida International University (FIU) Internal Review Board (IRB) was obtained before initiating the Quality Improvement project. Participants signed an informed consent form that showed they understood what the project entailed and agreed to participate. The study participant responses were anonymous and presented collectively to prevent any responses from being identified to individual participants. This project followed the standards and requirements set by the Internal Review Board to protect the participants.[9] The participation of the participants was completely voluntary, and the participants did not receive any compensation for participating in the project.

Data Collection

To assess the knowledge of the CRNAs about music therapy, a pre-test and a post-test in a survey format were completed. The pre-test provided an assessment of baseline knowledge and attitude of music therapy. The post-test was completed after the participant read through/listened to the presentation on the effects of music therapy in the perioperative period on adult patients undergoing a surgical procedure. The post-test was a good indicator that assessed what the CRNAs learned from the presentation. The participants were also asked, in the pre-test and post-test, about their thoughts and perceptions towards non-pharmacological modalities to treat pain and anxiety. The feedback received indicated that the CRNAs had a better attitude and are willing to put their new knowledge into practice. The data was recorded electronically, and the information that was received will be confidential and anonymous.

Management Plan

The pre-test and post-test were delivered to the CRNA through an email that they completed on their smartphone, computer, or iPad. The data that was collected was stored on a password-protected database that can only be accessed by the DNP student. This ensured that the participant's information and responses remained private and protected. This study followed strict security protocols to ensure the confidentiality of information. The results were reported in such a way as to keep the participants anonymous. Names and other personal information were not attached to the data that was used in the analysis. After the completion of the project, the data was permanently deleted.

Data Analysis

This project used both descriptive and inferential statistics to evaluate the data.[9] Descriptive statistics was used to summarize the pre-test and post-test scores, which helped provide insight into how much the CRNA's knowledge increased on using music therapy. Inferential statistics was used to determine the significance of any changes observed from the data that is collected. This helped determine the efficacy of the educational information that the CRNAs completed to improve their knowledge of music therapy to treat pain and anxiety in surgical patients.

Timeline

This project took eight months to complete. First, a literature review was done to create a project proposal. The next step was to obtain approval from the Internal Review Board. Once approval was obtained, emails were sent to the CRNA’s with information about the project and requested CRNAs to volunteer to participate in the project. The participants who consented to participate then took the pre-test, read the educational course, and then took the post-test. Data

was collected, and the researcher then assessed the impact of the educational materials that the CRNAs received. The findings were organized and studied to determine the results and to learn about the perceptions of the intervention among the CRNAs.

Results

This Quality Improvement Project started with a pre-test that tested the CRNA's baseline knowledge and perceptions regarding music therapy and its benefits in the perioperative period. The participants of this study answered five demographic questions. A pre-test was completed, which consisted of eleven questions on music therapy and its effect on the pain and anxiety of adult surgical patients in the perioperative period. After the pre-test, the participants went through the learning module to learn about music therapy in the perioperative period. The learning module discussed the effects music therapy has on opioid use, hemodynamic stability on, and the ability of music therapy on patients undergoing different types of surgeries. After the learning module, the participants completed the post-test, which consisted of the same eleven questions as the pre-test to evaluate knowledge retention and attitude changes towards music therapy in the perioperative period.

Table 1. Demographics of the participants.

The demographics of the participants are shown in Table 1.

Gender	Male (n %) 8 (80%)	Female (n %) 2 (20%)		
Age	31-40 (n %) 6 (60%)	41-50 (n %) 2 (20%)	51-60 (n %) 2 (20%)	61-70 (n %) 0 (0%)
Ethnicity	Hispanic (n %) 3 (30%)	Caucasian (n %) 4 (40%)	Asian (n %) 1 (10%)	Other (n %) 2 (20%)

Level Of Education	Certificate (n %)	Masters (n %)	DNP (n %)	PhD (n %)
	0 (0%)	3 (30%)	7 (70%)	0 (0%)
Experience	> 10yrs (n %)	5-10yrs (n %)	2-5yrs (n %)	< 2yrs (n %)
	1 (10%)	3 (30%)	5 (50%)	1 (10%)

There were ten participants who completed the pre-test and post-test. The majority of the participants were male (n = 8, 80%) compared to females (n = 2, 20%). There were several different ethnicities that participated: Hispanic (n = 3, 30%), Caucasian (n = 4, 40%), Asian (n = 1, 10%), and Other (n = 2, 20%). Most of the participants have received their Doctor of Nursing degree (n = 7, 70%), compared to receiving a Master of Nursing degree (n = 3, 30%). The experience among the CRNAs varied and ranged from more than 10 years (n = 1, 10%), 5-10 years (n = 3, 30%), 2-5 years (n = 5, 50%), and less than 2 years (n = 1, 10%).

Process measures included knowledge-based questions about the benefits of music therapy, its physiological effects, its effectiveness in different types of surgeries, and its potential to reduce opioid and benzodiazepine use. Post-survey results showed statistically and clinically significant improvement in the participant's knowledge of several of the questions. For instance, 60% of the CRNAs correctly identified that music therapy can reduce opioid use by up to 15%, and in the post-test, 80% of the participants answered the question correctly. When asked how long music should be played in the preoperative period to help decrease anxiety and stabilize vital signs, only 40% of the participants answered the question correctly (15 minutes) in the pre-test. In the post, 70% of the participants answered correctly, which is a 30% increase. When asked about the physiological effects that music has on patients in the perioperative period, 80% correctly answered in the pre-test that music regulates blood pressure and heart rate. In the post-

test, 90% of the participants correctly identified that music regulates blood pressure and heart rate, which is a 10% increase. Additionally, when asked in the pre-test about why music therapy is underutilized in the clinical setting, 70% of the CRNAs correctly identified it is because of insufficient knowledge among healthcare providers. In the post-test, all the CRNAs correctly answered why music therapy is underutilized, which represents a 30% increase when compared to the pre-test. Lastly, question 11 asked, "How likely are you to utilize music in the perioperative period?" Pre-intervention, 40% of the participants chose most likely, and 60% chose somewhat likely. While post-intervention, 70% of the participants chose most likely, and 30% chose somewhat likely. This shift indicates that the participants improved their knowledge of the benefits of music therapy, as well as increased their willingness to use music therapy in their practice.

Table 2. Summary of Pre- and Post-Test.

Table 2 compares the pre-test and post-test.

Question	Pre-test Correct (%)	Post-test Correct (%)	Improvement (%)
1. What is the primary goal of using music therapy in the perioperative period?	80%	80%	0%
2. What percentage of surgical patients experience preoperative anxiety?	80%	80%	0%
3. According to studies, how much can music therapy reduce narcotic use in surgical patients?	60%	80%	+20%
4. Which of the following is NOT a benefit of music therapy?	90%	90%	0%
5. How long should preoperative music therapy be applied to help reduce anxiety and stabilize vital signs?	40%	70%	+30%
6. Music therapy is effective in which of the following surgical settings?	100%	100%	0%
7. What physiological effects does music therapy have in the perioperative period?	80%	90%	+10%
8. What is one reason music therapy is underutilized in clinical settings?	70%	100%	+30%
9. Which of the following is a desired outcome of implementing music therapy in perioperative care?	90%	90%	0%

10. What is the significance of music therapy to Certified Registered Nurse Anesthetists (CRNAs)?	90%	90%	0%
11. How likely are you to utilize music in the perioperative period?	40% "most likely"	70% "most likely"	+30% increase

Several contextual factors interacted with the intervention, including all the participants being CRNAs with a high level of education (either a DNP or master's degree), which ensured that they had a foundational understanding of evidence-based practice and the effectiveness of multimodal approaches to treating patients' pain and anxiety. The clinical experience among the participants varied, with 40% of the participants having five or more years of experience, which provided a very strong background and knowledge of anesthesia and ways to treat pain and anxiety. The culture among CRNAs emphasizes patient-centered and holistic care, which supports the acceptance of non-pharmacological interventions such as music therapy. There were no negative attitudes towards the use of music therapy.

Observed Associations

Improved knowledge from the educational intervention directly correlated with an increased willingness to implement music therapy into their practice. One of the major reasons why CRNAs do not use music therapy in their practice is that they do not know how to properly implement it. This association suggests that increased knowledge is a critical driver of behavioral intention in clinical practice.

Missing Data

There were no missing data points in the pre-intervention or post-intervention surveys. All the participants completed every question for the pre-test and post-test. The demographic data was also fully reported. The high level of engagement contributes to strong reliability and validity.

Summary

Key Findings

This Quality Improvement Project demonstrated an improvement in the CRNAs' knowledge regarding perioperative music therapy. The average correct response rate rose from 78% in the pre-test to 87% in the post-test. Also, in the pre-test, 40% of the CRNAs said they would most likely use music therapy in the perioperative period. While after the educational module, 70% of the participants said they would be very likely to use music therapy in the perioperative period. This aligns closely with the project's aim to increase anesthesia providers' knowledge, attitude and awareness of music therapy and its benefits as a non-pharmacologic method to help treat patients' pain and anxiety in the perioperative period.

Strengths of the Project

Key strengths of this project included the use of evidence-based educational content. The design of the project allowed for pre- and post-intervention comparisons, before and after a Zoom educational voice over educational module which ensured reliable measurement of impact. Also, the inclusion of experienced CRNAs increased the applicability and relevance of the findings to the actual clinical setting.

Limitations

The results from this Quality Improvement Project are specific to CRNAs and may not be generalizable to other perioperative providers. The reason is the differences in training, roles, and responsibilities; these may influence the applicability of the findings. Another limitation includes the small sample size of this QI project. These factors could have an influence on the internal validity of the findings. In an effort to minimize bias, the surveys were taken anonymously, and

the educational module was the same among all participants. Using objective, knowledge-based questions rather than subjective questions help strengthen the data reliability.

Interpretation

There is a clear and positive association between educational intervention and improved participant knowledge. There is also a positive association between the educational intervention and the intention to use music therapy in the clinical setting. Increasing knowledge is a powerful tool that can help change people's attitudes and behaviors.

The findings from this project are in line with prior research studies that have found music therapy to be effective in reducing adult surgical patients' pain and anxiety, stabilizing vital signs, and lowering medication usage. Improving provider knowledge using an educational module is consistent with best practices in continuing education.

This quality improvement project had a positive impact on the participants and their perioperative practice. Seventy percent of the participants answered that they are most likely to incorporate music therapy into their practice. This will potentially benefit adult surgical patients by reducing their pain and anxiety levels, improving patient satisfaction, and hopefully minimizing the reliance on pharmacological therapies.

This QI project was cost-effective; it utilized freely available tools, for example, cellphones and literature explaining the benefits of music therapy. The main investment was time by both the author of this Quality Improvement project and the participants. Music therapy is a cost-effective treatment, as most people have a phone that they can use to access their favorite music. Given the potential for decreased medication use and the opportunity to increase patient satisfaction, these costs represent a considerable trade-off with a long-term benefit.

Implications for Advanced Practice Nursing

This QI project highlights the role of CRNAs and other advanced practice nurses in being leaders in healthcare. Their roles in leading evidence-based, patient-centered care are so important to bettering patient outcomes. This project also emphasizes how important it is to use multimodal analgesia, including music therapy, in the perioperative period in order to provide optimal patient care.

Conclusion

This QI project provides awareness to CRNAs about the usefulness of music therapy in the perioperative period and its impact on pain and anxiety levels. It encourages anesthesia providers to utilize music therapy in the perioperative period for adult surgical patients. The fact that music therapy is low-cost and easy to implement makes it highly sustainable and justifiable to use. Education on music therapy can be used in existing continuing education programs on the use of non-pharmacological adjuvant treatment options for pain and anxiety. With how simple it is to use and the evidence behind music therapy, the intervention can be easily used by other surgical team members, like preoperative nurses and postoperative care nurses. The research supports patient-centered care and may help reduce healthcare costs and aligns with broader goals of reducing opioid use. This project ultimately answered the research question: In adult surgical patients does music therapy in the perioperative period compared to opiates and benzodiazepines increase provider knowledge and attitude in decreasing pain and anxiety levels increase patient satisfaction and decrease PACU stay?

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Appendix

Appendix A: Summary of the Literature Table

Citation	Design/Method	Sample/Setting	Major Variables Studied and Their Definitions	Measurement And Data Analysis	Findings	Results	Conclusions	Appraisal: Worth to Practice/Level
Laframboise-Otto et al,[1] 2021	This study is a randomized control trial that looks at the effects of music on patients undergoing arthroplasty surgery.[1]	There were 50 participants in the study.[1] The participants were 18-90 years old, undergoing elective arthroplasty surgery.[1] There were 3 participants who withdrew from the study.[1] The study was completed at a large university-affiliated hospital in the United States.[1]	IV 1- Listening to music for 30 minutes three times a day.[1] IV 2- Prescribed opioid and nonopioid medication.[1] DV 1- Postoperative pain intensity.[1] DV 2- Amount of analgesic medication was used.[1]	The researchers used a Numeric Rating Scale (NRS) to measure the participant's pain level.[1] They did not use any specific reliability measures.[1] Statistical methods included ANCOVA for comparing pain levels between the two groups. Descriptive statistics and T-tests were used to analyze medication usage.[1]	The participants in the group that listened to music reported lower pain levels postoperatively in the hospital and at home.[1]	Lower pain levels in the group that listened to music. No difference between the two groups in the number of analgesics taken.[1]	Combining music therapy with prescribed analgesic therapy was effective in decreasing the patient's postoperative pain levels.[1] This study supports the use of music as an adjunct to pain management.[1]	The strengths of the study include the design of the study (randomized control trial) and the examination of pain levels both in the hospital and at home.[1] Limitations include the small sample size, lack of blinding, and reliance on the participants to self-report their data.[1] This study is a randomized control trial, which makes it level II evidence.

Citation	Design/Method	Sample/Setting	Major Variables Studied and Their Definitions	Measurement And Data Analysis	Findings	Results	Conclusions	Appraisal: Worth to Practice/Level
Mishra et al,[2] 2022	This study utilized a randomized controlled trial design.[2] They studied the effects that music has on pain and anxiety levels in patients undergoing robotic-assisted laparoscopic prostatectomy.[2]	This study included 40 adult male participants undergoing robotic-assisted laparoscopic prostatectomy.[2] The participants did not have any prior history of chronic pain or chronic opioid use.[2] This study took place in University Hospitals in Cleveland, Ohio.[2]	IV 1- Music therapy. Patients listened to music for 30 minutes in the postoperative recovery area and for 30 minutes on postop day one.[2] IV 2- Control group. These patients did not listen to music.[2] DV 1- Postoperative narcotic use.[2] DV 2- Anxiety levels, measured using the State-Trait Anxiety Inventory.[2]	The researchers use the morphine milligram equivalents ratio scale to measure opioid use.[2] They also used the State-Trai Anxiety Inventory scale to measure the patient's anxiety levels.[2] T-tests and Chi-square tests were utilized to compare the two different groups.[2]	There was a significant difference in anxiety levels between the two groups.[2] There was a 26% reduction in post-hospital opioid use in the patients who listened to music.[2]	The group that listened to music used fewer opioids after discharge, but it did not have a major impact on anxiety levels.[2]	Music therapy is a helpful, safe, and cost-effective intervention to decrease opioid use in patients undergoing robotic-assisted laparoscopic prostatectomy.[2]	The strengths of the study are the randomized control design and consistency in data collection with a single nurse practitioner doing the surveys.[2] Limitations include the small sample size, the inability to have it be a blind study, and the fact that there was no preoperative baseline anxiety measurement.[2] This intervention is low risk with minimal risks if implemented.[2] Music therapy is highly feasible. It is cost-effective and can easily be added to postoperative care treatments.[2] This study is a randomized control trial, which makes it level II evidence.

Citation	Design/Method	Sample/Setting	Major Variables Studied and Their Definitions	Measurement And Data Analysis	Findings	Results	Conclusions	Appraisal: Worth to Practice/Level
Kavak Akelma et al,[4] 2020	This study is a randomized, single-blinded, control trial.[3] Participants were placed into two separate groups.[3] The first group listened to their favorite music for 15 minutes in the preoperative area.[3] The second group did not listen to music.[3]	One hundred seventeen patients were ASA I-III, 18-70 years old, and undergoing elective inguinal hernia surgery.[3] There were 15 patients that were excluded from the study.[3] The research was done at a university hospital in Ankara, Turkey.[3]	IV 1- Listening to favorite music for 15 minutes in the preoperative period.[3] IV 2- A control group that did not listen to music.[3] DV 1- Postoperative pain and anxiety levels.[3] DV 2- Hemodynamic parameters.[3] DV 3- Patient satisfaction.[3]	Anxiety levels were measured by the State-Trait Anxiety Inventory scale.[1] Pain was rated on the Numeric Rating Scale.[3] No specific reliability tool was mentioned in the article.[3] Mann-Whitney U-tests, t-tests, and chi-square tests were done to compare the results between the two groups.[3]	Postoperative anxiety was lower in the group that listened to music with a p-value of 0.025.[3] Hemodynamic measurements, such as blood pressure and heart rate, were improved in the patients that listened to music.[3] Pain scores were not significantly different between the two groups, $p > 0.05$.[3] Patient satisfaction was higher in the group that listened to music, $p = 0.017$.[3]	The group that listened to their favorite music preoperatively had lower anxiety levels.[3] Blood pressure, heart rate, and patient satisfaction all improved in the group that listened to music.[3] There was no difference in postoperative pain control between the two groups.[3]	When the patient listens to their favorite music before surgery, it reduces postoperative anxiety, increases patient satisfaction, and stabilizes hemodynamic parameters.[3] It does not significantly affect postoperative pain levels.[3]	The study is a randomized, single-blinded control trial, which strengthens the evidence.[3] The study provides strong evidence that listening to music reduces anxiety levels and improves patient satisfaction.[3] Limitations include not examining the long-term effects and not comparing different types of music.[3] Multimodal analgesia was used on all patients, which may have masked the potential pain-relieving effects of the music.[3] There are minimal risks to implementing music therapy.[3] Music therapy is low-cost, non-invasive, and easy to implement in patient care.[3] This study is a randomized control trial, which makes it level II evidence.

Citation	Design/Method	Sample/Setting	Major Variables Studied and Their Definitions	Measurement And Data Analysis	Findings	Results	Conclusions	Appraisal: Worth to Practice/Level
Gogoularadja et al,[11] 2020	This study is a randomized control trial.[4] The researchers compared two groups of patients undergoing nasal septal surgery.[4] Group A did not listen to music, and Group B listened to music twice a day for 30 minutes.[4]	There were 59 participants, 30 in Group A and 29 in Group B.[4] There was one participant who did not complete the study.[4] The participants were 18-55 years old with a deviated nasal septum undergoing nasal septal surgery.[4] Patients could not have hearing loss, neurological disorders, narcotic use, or hypertension.[4] This study was completed at Mahatma Gandhi Medical College and Research Institute in Pondicherry, India.[4]	IV 1- Music therapy. IV 2- Standard postoperative care. DV 1- Anxiety scores. DV 2- Pain scores	The GAD-7 Scale is an ordinal scale that measures anxiety.[4] A Visual Analogue Scale was used to measure the patient's pain level.[4] The Visual Analogue Scale is where patients select a face that represents their pain level.[4] Mann-Whitney U test was used to compare the two groups.[4]	The group that listened to music had a significant reduction in preoperative and postoperative anxiety levels with p-values of < 0.001.[4] The patients who listened to music also had significantly less pain from postop day zero to postop day two with a p-value < 0.001.[4]	The group that listened to music experienced a reduction in both pain and anxiety levels compared to the group that did not listen to music.[4] The decreased pain and anxiety levels started right after surgery and lasted until postop day two.[4]	Music therapy is an effective, cost-effective, and safe adjunct to help reduce pain and anxiety postoperatively in nasal septal surgery patients.[4]	The strengths of this study are the randomized control trial design, the music was selected based on patient preference, and there were statistically significant findings.[4] Limitations include a small sample size and non-standardized type of music, and the study was limited to nasal septal surgery.[4] There are no risks to implementing music therapy, and it is easy to add to patient care.[4] This study is a randomized control trial, which makes it level II evidence.

Citation	Design/Method	Sample/Setting	Major Variables Studied and Their Definitions	Measurement And Data Analysis	Findings	Results	Conclusions	Appraisal: Worth to Practice/Level
Drzymalski et al,[8] 2020	This study is a randomized control trial.[5] They studied women undergoing elective cesarean delivery who were placed into three random groups: patient-selected music (Pandora), preselected music (Mozart), and no music (control group).[5] The researchers evaluated anxiety levels preoperatively and postoperatively, along with pain and patient satisfaction.[5]	There were 150 women, ages 18-50 years old.[5] The exclusion criteria for the participants included deafness, contraindications to neuraxial anesthesia, and active labor.[5] One participant dropped out of the study due to cancellation.[5] This study took place in Boston, Massachusetts.[5]	IV 1- Patient-selected music. IV 2- Preselected music. IV 3- No music. DV 1- Anxiety levels. DV 2- Pain levels. DV 3- Patient satisfaction.	The patients measured their pain and anxiety levels with a Numeric Rating Scale.[5] Patient satisfaction was measured with a 7-point Likert scale.[5] No specific reliability measures were mentioned, but the Numeric Rating Scale and Likert scales are acceptable tools in clinical studies.[5] T-tests, Wilcoxon rank-sum test, chi-square, and Fisher's exact test were used to compare the groups.[5]	The group that listened to Mozart had significantly reduced preoperative anxiety compared to the control group, with a p-value of 0.03.[5]. The group that listened to patient-selected music did not show a significant difference in anxiety levels.[5] Postoperative anxiety and pain levels were lower in the group that listened to Mozart compared to the control group.[5] There was no difference in patient satisfaction among the three groups.[5]	Mozart music reduced preoperative anxiety and postoperative pain levels.[5] Patients' preselected music did not affect anxiety or pain levels.[5] The group that listened to Mozart reported more comfort while in the operating room, but patient satisfaction did not vary among the three groups.[5]	When patients listened to preselected Mozart music, they experienced less pain and anxiety during their cesarean delivery.[5] Patient-selected music had no effects on pain and anxiety levels.[5]	The strengths of this study include the randomized control design, the use of the Numerical and Likert scale, and clear outcome measures.[5] Limitations of the study include the lack of ability to blind, variable music choices in the preselected music group, and a potential bias from the participants knowing that anxiety is being studied.[5] There is minimal risk in using music therapy.[5] The use of Mozart's music could be used in perioperative care to reduce pain and anxiety levels.[5] This study is a randomized control trial, making it level II evidence.

Citation	Design/Method	Sample/Setting	Major Variables Studied and Their Definitions	Measurement And Data Analysis	Findings	Results	Conclusions	Appraisal: Worth to Practice/Level
Cimen et al,[7] 2020	This study is a randomized, single-blind control trial.[6] The patients were put into two different groups; the first group listened to music, and the second group did not.[6] Anxiety, pain, and patient satisfaction were all measured.[6]	There were 55 patients who were initially signed up for the study, but 14 participants did not complete the study.[6] The participants were undergoing arteriovenous fistula surgery.[6] The study was completed at Diskapi Research and Training Hospital in Ankara, Turkey.[6]	IV 1- Music exposure during surgery. IV 2- No music exposure. DV 1- Anxiety levels. DV 2- Pain levels. DV3- Patient satisfaction. DV 4- Hemodynamic parameters.	The researchers used the State-Trait Anxiety Inventory scale to measure anxiety levels.[6] To measure pain, the researchers used a Visual Analog Scale.[6] To assess patient satisfaction, the patients took a survey.[6] Statistical analysis included the use of t-tests, Mann-Whitney U test, and Chi-square tests. P values less than 0.05 were considered significant.[6]	Postoperative anxiety scores were much lower in the group that listened to music, with a p-value of 0.025.[6]. Pain levels were also lower in the music group, with a p-value of < 0.001.[6]. Postoperative blood pressure, heart rate, and respiratory rates were lower in the music group.[6]	Music therapy reduced anxiety and pain levels and improved patient satisfaction.[6] The patients who listened to music had more stable hemodynamic measurements.[6]	The researchers concluded that music therapy can be an effective treatment for reducing anxiety and pain levels and improving patient experience during arteriovenous fistula surgery.[6]	Strengths of the study include the randomized and blinding design, clear measurement tools, and significant findings.[6] Limitations of the study include the small sample size and a high attrition rate.[6] There are minimal risks from using music therapy, and it is highly feasible to use in the clinical setting.[6] This study is a randomized control trial, which makes it level II evidence.

Citation	Design/Method	Sample/Setting	Major Variables Studied and Their Definitions	Measurement And Data Analysis	Findings	Results	Conclusions	Appraisal: Worth to Practice/Level
Luis et al.,[3] 2019	This study is a randomized control trial.[7] Patients undergoing cardiac surgery were placed into two different groups; the first group listened to music for 20-30 minutes before and after surgery.[7] The second group did not listen to any music.[7] The researchers measured pain, anxiety, and hemodynamic measures.[7]	There were 12 adult patients in the study who were undergoing elective septal myectomy, valve replacement, or coronary bypass graft surgery.[7] All the patients completed the study.[7] The study was completed at the Aswan Heart Centre in Aswan, Egypt.[7]	IV 1- Music intervention. IV 2- The control group did not listen to music. DV 1- Pain level. DV 2- Anxiety level. DV 3- Hemodynamic measures. DV 4- Serum cortisol levels.	The researchers used the Hamilton Anxiety Assessment Scale to measure the patient's anxiety levels.[7] To measure the patient's pain level, the researchers used the Visual Analogue Scale.[7] The researchers also measured the patient's heart rate, blood pressure, respiratory rate, as well as serum cortisol levels.[7] The researchers used the Wilcoxon Signed Ranks Test to compare the two groups.[7]	There were significantly lower pain scores in the patients who listened to music on the first and second days after surgery, with a p-value of 0.039.[7] There were reductions in heart rate, anxiety scores, and serum cortisol levels in the group that listened to music [7]	The group that listened to music had reduced respiratory rates, heart rates, pain and anxiety levels, and cortisol levels.[7] The group that did not listen to music did not have any changes in any of the parameters.[7]	Live oud music therapy can help reduce the stress response, pain levels, and anxiety levels in patients undergoing cardiac surgery.[7]	The strengths include the randomized control design, and it is the first study to explore live music therapy with culturally appropriate music. [7] Limitations include the small sample size and lack of follow-up on the long-term effects.[7] There is minimal risk to music therapy.[7] Live music may not be as feasible as pre-recorded music.[7] This article is a randomized control trial, which makes it level II evidence.

Citation	Design/Method	Sample/Setting	Major Variables Studied and Their Definitions	Measurement And Data Analysis	Findings	Results	Conclusions	Appraisal: Worth to Practice/Level
Deng et al,[12] 2022	This is a randomized control trial that studies the effects of aromatherapy and music therapy on pain and anxiety levels in patients undergoing breast cancer surgery.[8]	There were 160 participants, all of whom were females older than 18 years old.[8] The participants had breast cancer and were undergoing a mastectomy.[8] The attrition rate was zero.[8] The study took place at Xiangya Hospital, Central South University in Changsha, China.[8]	IV 1- Aromatherapy. IV 2- Music therapy. IV 3- Combination therapy with aromatherapy and music. IV 4- No music or aromatherapy. DV 1- Pain levels. DV 2- Anxiety levels. DV 3- Inflammatory markers.	To measure pain and anxiety levels, the researchers utilized a Visual Analog Scale.[8] The researchers also measured the inflammatory markers interleukin-6 (IL-6) and High mobility group box 1 (HMGB-1) levels.[8] The Visual Analog Scale, IL-6, and HMGB-1 are reliable measures.[8] The researchers used analysis of variance with Bonferroni adjustments to compare the different groups.	The group with the greatest improvement in pain and anxiety levels was the combination group, with a p-value < 0.001.[8]. There were significant reductions in the IL-6 and HMGB-1 levels in all the groups besides the control group.[8]	The group that had both aromatherapy and music therapy had the biggest reduction in pain and anxiety levels.[8] The aromatherapy group and music therapy group both had reduced pain and anxiety levels, but there was no significant difference between these two groups.[8]	Aromatherapy combined with music therapy was more effective in reducing pain and anxiety levels than either therapy by itself.[8]	The strength of the study includes the randomized control design.[8] Another strength was the use of subjective (pain and anxiety) and objective (inflammatory markers) measurements.[8] Limitations of the study include the lack of blinding the participants.[8] There are no significant risks when including music as an intervention in patient care.[8] Music therapy is an easy and cost-effective intervention that can be used in the perioperative period. This study is a randomized control trial, which makes it level II evidence.

Citation	Design/Method	Sample/Setting	Major Variables Studied and Their Definitions	Measurement And Data Analysis	Findings	Results	Conclusions	Appraisal: Worth to Practice/Level
Musa et al,[13] 2022	This randomized control trial studies the anxiety levels of patients undergoing cataract extraction.[9] The researchers also measured the patient's blood pressure and salivary alpha-amylase (sAA levels).[9] The participants were separated into two groups; group one listened to piano music, and group two did not listen to any music.[9]	There were 92 participants in this study.[9] The participants must have been 40 years old or older, be able to give consent, and have age-related cataracts. The exclusion criteria included patients hearing impairments, previous sedative use, surgical complications, and prolonged surgery times.[9] Eight patients were excluded from the study due to surgical complications.[9] The study was conducted at the University of Malaya, Kuala Lumpur, Malaysia.[9]	IV 1- Music therapy. IV 2- No music therapy, control group. DV 1- Anxiety levels. DV 2- Blood pressure and heart rate. DV 3- Salivary alpha-amylase levels.	The researchers measured anxiety levels with the Visual Analog Scale.[9] The researchers used t-tests and Mann-Whitney tests to compare the groups.[9] They also used the Pearson Chi-square test and Fisher's Exact test for categorical data.[9]	The group that listened to music had a significant reduction in sAA levels when compared to the control group, with a p-value of 0.047.[9] Anxiety levels were also significantly lower in the participants that listened to music, with a p-value of 0.046.[9]. The participants in the music group also experienced a decrease in blood pressure at the incision, with a p-value of 0.023.[9]	Slow-tempo music significantly reduced patients' anxiety levels and several markers of anxiety (sAA levels, blood pressure).	The researchers concluded that slow-tempo music can significantly reduce anxiety levels in patients undergoing cataract surgery.[9]	The strengths of the study include the randomization and a relevant clinical issue that can potentially reduce the patient's need for sedative medications.[9] The study was non-blinded, which limited its strength.[9] There are no risks or harms associated with using music therapy in patient care.[9] Using music during the perioperative period is cost-effective and would be easy to implement.[9] This study is level II evidence.

Citation	Design/Method	Sample/Setting	Major Variables Studied and Their Definitions	Measurement And Data Analysis	Findings	Results	Conclusions	Appraisal: Worth to Practice/Level
Law et al,[14] 2021	This study is a prospective randomized controlled trial.[10] The participants were divided into two groups; one group listened to music, and the other group did not.[10] The researchers measured pain, blood pressure, and heart rate before and during the procedure.[10]	There were 107 participants, but four patients were excluded from the study due to incomplete procedures caused by a tight cervical os.[10] The patients needed to have a hysteroscopy must have been able to read English or Chinese and be able to consent.[10] The patients could not have a hearing impairment and known congenital uterine anomalies.[10] The study was conducted in an outpatient setting in Hong Kong, China.[10]	IV 1- Music therapy. IV 2- No music during the procedure. DV 1- Pain level. DV 2- Heart rate and blood pressure.	The researchers used a Visual Analog Scale to measure pain levels.[10] The researchers also measured the participant's blood pressure and heart rate.[10] The Visual Analog Scale is a commonly used tool for measuring pain.[10] T-tests were used to compare the results of the two groups.[10]	The participants in the music group reported significantly lower pain scores compared to the group that did not listen to music.[10]	Music significantly reduced the patient's pain level when undergoing hysteroscopy surgery.[10] There were no significant changes in blood pressure and heart rate.[10]	The researchers concluded that when music is played during hysteroscopy surgery, patients experience less pain.[10] The authors recommend the use of music during outpatient hysteroscopy.[10]	The study's strengths include the randomized design and clear outcomes.[10] Limitations include it being a non-blinding study.[10] There is minimal risk to implementing music therapy, and it is a safe and non-invasive intervention.[10] It is highly feasible to add music therapy in clinical settings.[10] This study is of level II evidence.

Appendix B: QI Project IRB Exemption

FIU | FLORIDA INTERNATIONAL UNIVERSITY

Office of Research Integrity
Research Compliance, MARC 414

MEMORANDUM

To: Dr. Christina Vera
CC: Kolton Harris

From: Maria Melendez-Vargas, MIBA, IRB Coordinator 

Date: March 20, 2025

Protocol Title: "The Impact of Perioperative Music on Pain and Anxiety Management in Surgical Patients: A Quality Improvement Project"

The Florida International University Office of Research Integrity has reviewed your research study for the use of human subjects and deemed it Exempt via the **Exempt Review** process.

IRB Protocol Exemption #: IRB-25-0123 **IRB Exemption Date:** 03/20/25
TOPAZ Reference #: 115236

As a requirement of IRB Exemption you are required to:

1) Submit an IRB Exempt Amendment Form for all proposed additions or changes in the procedures involving human subjects. All additions and changes must be reviewed and approved prior to implementation.
2) Promptly submit an IRB Exempt Event Report Form for every serious or unusual or unanticipated adverse event, problems with the rights or welfare of the human subjects, and/or deviations from the approved protocol.

Special Conditions: N/A

3) Submit an IRB Exempt Project Completion Report Form when the study is finished or discontinued.

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

MMV/em

Appendix C: QI Project Consent

CONSENT TO PARTICIPATE IN A QUALITY IMPROVEMENT PROJECT

The Impact of Perioperative Music on Pain and Anxiety Management in Surgical Patients.

SUMMARY INFORMATION

Things you should know about this study:

- **Purpose:** Educational module to increase providers awareness of the effects that music therapy can have on pain and anxiety in surgical patients in the perioperative period.
- **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 the benefits of using music therapy to help decrease patients' pain and anxiety in the perioperative period.
- **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 one of 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 the benefits of using music therapy to help decrease patients' pain and anxiety levels in the perioperative period which may decrease the amount of opioids and anxiolytics the patient will need. 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:
1. Complete an online 10 question pre-test survey via Qualtrics, an Online survey product for which the URL link is provided
2. Review the educational PowerPoint Module lasting 15 minutes via Qualtrics, an Online survey product for which the URL link is provided.
3. 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: Increase participants knowledge on the benefits of music therapy in the perioperative period for adult surgical patients. The major benefit is the potential to decrease the use of opioids and benzodiazepines. 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 participants 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
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 Kolton Harris at 435-559-5127 / Kharr150@fiu.edu and Christina Vera at 305-348-7728 / chvera@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: QI Project Letter of Support
Appendix E: QI Project Pre-test and Post-test Survey

Pre-test and Posttest Questionnaire:

The Impact of Perioperative Music on Pain and Anxiety Management in Surgical Patients.

INTRODUCTION

The primary aim of this QI project is to increase providers awareness on the benefits of using music therapy to help treat adult surgical patients' pain and anxiety in the perioperative period.

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 on the benefits of using music therapy to help treat adult surgical patients' pain and anxiety in the perioperative period.

PERSONAL INFORMATION

1. **Gender:**
    a. Male
    b. Female
    c. Other
2. **Ages:**
    a. 25-30
    b. 31-40
    c. 41-50
    d. 51-60
    e. 61-70
3. **Ethnicity:**
    a. Hispanic
    b. Caucasian

c. African American

d. Asian

e. Other

4. **Level of Education:**

    a. Certificate

    b. Masters

    c. DNP

    d. PhD

5. How many years have you been an anesthesia provider?

    a. Over 10

    b. 5-10 years

    c. 2-5 years

    d. Less than 2 years

QUESTIONNAIRE

1. What is the primary goal of using music therapy in the perioperative period?

a. To completely eliminate pain

b. To replace pharmacological treatments

c. To complement pharmacological treatments and reduce pain and anxiety

d. To entertain the surgical team

2. What percentage of surgical patients experience preoperative anxiety?

a. 20-40%

b. 40-50%

c. 60-80%

d. 90-100%

3. According to studies, how much can music therapy reduce narcotic use in surgical patients?

a. Up to 10%

b. Up to 15%

c. Up to 26%

d. Up to 50%

4. Which of the following is NOT a benefit of music therapy?

a. Reducing anxiety and pain

b. Decreasing reliance on opioids and benzodiazepines

c. Providing a cost-effective treatment option

d. Curing chronic conditions

5. How long should preoperative music therapy be applied to help reduce anxiety and stabilize vital signs?

a. 5 minutes

b. 10 minutes

c. 15 minutes

d. 30 minutes

6. Music therapy is effective in which of the following surgical settings?

a. Orthopedic

b. Cardiac

c. Cesarean Section

d. All the above

7. What physiological effects does music therapy have in the perioperative period?

a. Increases heart rate and blood pressure

b. Regulates blood pressure and heart rate

c. Decreases oxygen saturation levels

d. Activates the sympathetic nervous system

8. What is one reason music therapy is underutilized in clinical settings?

a. Lack of patient interest

b. Insufficient knowledge among healthcare providers

c. High cost of implementation

d. Limited evidence supporting its effectiveness

9. Which of the following is a desired outcome of implementing music therapy in perioperative care?

a. Increased reliance on pharmacological treatments

b. Decreased patient satisfaction

c. Decreased medication dependence

d. Prolonged recovery periods

10. What is the significance of music therapy to Certified Registered Nurse Anesthetists (CRNAs)?

a. Helps CRNAs avoid non-pharmacological treatments

b. Increases dependence on opioids

c. Provides holistic and patient-centered care

d. Reduces patient safety

11. How likely are you to utilize music in the perioperative period?

a. Most likely

b. Somewhat likely

c. Somewhat unlikely

d. Most unlikely

Appendix F: QI Project Educational Module

The Impact of Perioperative Music on Pain and Anxiety Management in Surgical Patients: A Quality Improvement Project

Kolton Harris BSN

Christina Vera PhD, DNP, CRNA

FIU Nicole Wertheim College of Nursing & Health Sciences

Learning Goals

- From this Quality Improvement project, the reader will:
  - Understand the role of music therapy in perioperative care.
  - Explore evidence-based findings on music therapy for reducing pain and anxiety in the perioperative period.
  - Analyze the effect that music therapy may have on medication use and patient outcomes.
  - Identify effective ways to implement music therapy in clinical practice.

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PICO Question

- In adult surgical patients does music therapy in the perioperative period compared to opiates and benzodiazepines increase provider knowledge and attitude in decreasing pain and anxiety levels increase patient satisfaction and decrease PACU stay?
- P (Population)- Adult surgical patients
- I (Intervention)- Music therapy
- C (Comparison)- No music therapy
- O (Outcomes)- Decreased pain and anxiety levels

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Background

- Depending too much on opioids and benzodiazepines in surgical care can contribute to adverse effects and dependency.
- Most patients experience pain and/or anxiety when having a surgical procedure.
- Music therapy offers the patient a safe, non-invasive, and cost-effective treatment option to complement the pharmacological interventions.

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Scope of the Problem

- 40-50 million surgeries are performed each year in the United States.
- 60-80% of surgical patients reported preoperative anxiety that contributed to delayed recovery.
- In 2022, there were over 73,000 opioid overdose deaths and over 10,000 benzodiazepine overdose deaths.
- Opioid-related side effects and overdose treatment cost is over $78 billion each year.

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Problem Statement

- Relying too much on opioids and benzodiazepines can be problematic due to the potential adverse effects and long-term risks.
- If pain and anxiety are not well-managed, it can lead to delayed healing, increased healthcare costs, and decreased patient satisfaction.
- Music therapy has many benefits, but it is underutilized in clinical settings.

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Education on Music Therapy

- Studies have shown that music is effective at decreasing perioperative pain and anxiety levels in adult surgical patients.
- Mishra et al. found that music therapy can lower narcotic use by up to 26%.
- Music therapy regulates physiological responses (blood pressure and heart rate).
- Music therapy is a safe, non-pharmacological, cost-effective adjunctive treatment option.

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Education on Music Therapy

- Music therapy has been shown to be effective in various surgical settings:
  - Orthopedic (hip and knee arthroplasty)
  - Cardiac
  - Vascular
  - General (hernia repair)
  - Cesarean Section and mastectomies.

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Education on Music Therapy

- Preoperative music for just 15 minutes can help reduce anxiety and stabilize vital signs.
- Postoperative music for 30 minutes can help reduce pain perception and enhance recovery.
- Music therapy decreases sympathetic nervous system activity, which reduces perioperative stress, pain, and anxiety.

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Proposed Intervention

- Allow the patient to listen to their preferred calming music for at least 15 minutes before surgery.
- Have the patient listen to soothing music for 30 minutes in the Post Anesthesia Care Unit (PACU) after surgery.
- Encourage the patient to listen to calming music for at least 30 minutes a day during recovery.

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Desired Practice Change

- Increase the use of music therapy in surgical patient perioperative care.
- Optimize patient care and outcomes.
- Provide CRNAs with knowledge and ability to use music therapy as an adjunct therapy.
- Decrease reliance on opioid and benzodiazepine medications.

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Significance to CRNAs

- Music therapy helps provide holistic and patient-centered care.
- Music therapy helps reduce CRNA's dependence on opioids and anxiolytics and decreases the risk of addiction and negative side effects.
- Music therapy can enhance the patient's recovery by addressing psychological and physiological needs.

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Take-Home Points

- Music therapy is a safe and cost-effective intervention for perioperative care.
- Evidence supports the use of music therapy to help reduce pain and anxiety.
- Can help reduce medication dependence and the amount of medication the patient needs.
- Music therapy can improve patient outcomes and satisfaction scores.

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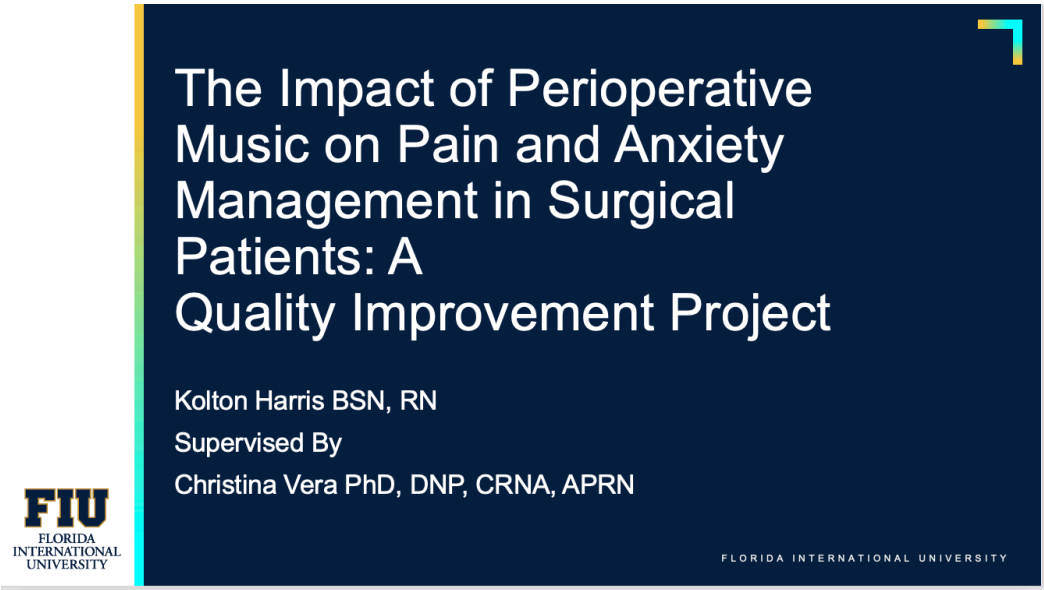
Appendix G: QI Dissemination



Problem Identification

- Anesthesia providers rely heavily on opioids to treat pain and benzodiazepines to treat anxiety in surgical patients.
- Associated risks: dependency, adverse effects and prolonged recovery.
- United States is currently in an opioid crisis
  - More than 73,000 deaths occurred in 2022 from opioid overdose.
  - More than 10,000 deaths occurred in 2022 from benzodiazepine overdose.
- Need an effective, safe, and non-pharmacological alternatives.

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Background

- Surgery can cause significant pain and anxiety.
- Uncontrolled/untreated pain/anxiety can affect vital signs, delay wound healing, and decrease patient satisfaction.
- Music therapy is a cost-effective and non-invasive intervention.
- Music therapy affects the dopaminergic and endogenous opioid systems.

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Scope and Consequences

- Each year there are 40-50 million surgeries in the US.
- 60-80% of patients experience pre-operative anxiety.
- Opioid misuses costs around $78 billion each year.
- Poor pain and anxiety management leads to increased complications, longer hospital stays, and chronic pain.

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PICO Question

In adult surgical patients, P, does music therapy in the perioperative period, I, compared to opiates and benzodiazepines, C, increase provider knowledge and attitude in decreasing pain and anxiety levels, O, increase patient satisfaction and decrease PACU stay?

Population (P)- Surgical patients

Intervention (I)- Music therapy

Comparison (C)- No music therapy

Outcomes (O)- Decrease pain and anxiety levels

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DNP Project Purpose

- Increase Certified Registered Nurse Anesthetists (CRNA) knowledge and awareness of the benefits of music therapy.
- Opioids and benzodiazepines can have harsh side effects and lead to other problems.
- Music therapy can increase patients' safety, satisfaction, and decrease medication usage.

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Quality Improvement Methods

- Education module on music therapy in the perioperative period.
- Ten CRNAs took the pre-test, then went over the education module, and then did the post-test.
- The goal was to increase the CRNAs knowledge and perception of music therapy.

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Quality Improvement Methods

- Settings and Participants
  - Large Level 1 Trauma Center in South Florida
  - Diverse patient population
  - Participants were CRNAs
    - 70% had DNP degree, and 30% had a masters degree
    - Mixed experience levels ranging from less than 2 years to more than 10 years.

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Quality Improvement Results

- Pre-test average correct answer was 78%
- Post-test average correct answer was 87%
- Likelihood to use music therapy increased from 40% (pre-educational module) to 70% (post-educational module).
- CRNAs gained knowledge in music therapy's ability to reduce opioid use and stabilize vital signs.

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Results Summary Table

Question	Pretest Correct (%)	Posttest Correct (%)	Improvement (%)
1. What is the primary goal of using music therapy in the perioperative period?	80%	80%	0%
1. What percentage of surgical patients experience preoperative anxiety?	80%	80%	0%
1. According to studies, how much can music therapy reduce narcotic use in surgical patients?	60%	80%	+20%
1. Which of the following is NOT a benefit of music therapy?	90%	90%	0%
1. How long should preoperative music therapy be applied to help reduce anxiety and stabilize vital signs?	40%	70%	+30%
1. Music therapy is effective in which of the following surgical settings?	100%	100%	0%
1. What physiological effects does music therapy have in the perioperative period?	80%	90%	+10%
1. What is one reason music therapy is underutilized in clinical settings?	70%	100%	+30%
1. Which of the following is a desired outcome of implementing music therapy in perioperative care?	90%	90%	0%
1. What is the significance of music therapy to Certified Registered Nurse Anesthetists (CRNAs)?	90%	90%	0%
1. How likely are you to utilize music in the perioperative period?	40% "most likely"	70% "most likely"	+30% increase

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Discussion

- CRNAs knowledge of music therapy increased as well as their intent to implement music therapy into their practice.
- Music therapy should be played for at least 15 minutes in order to stabilize vital signs.
- Opioid use can decrease by up to 26% when music therapy is used.
- Music therapy is part of the multimodal analgesia treatment options.

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Discussion

- Strengths
  - The learning module is evidence-based
  - There is no missing data
  - Diverse participant experience and background
- Limitations
  - Small sample size (10 participants)
  - Limited generalizability
  - Focused only on CRNAs

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Discussion

- Implications for Advanced Nursing Practice
  - CRNAs are valuable resources when it comes to quality improvement.
  - Advanced Practice Nurses are so important to healthcare and can help improve patient satisfaction and safety by following evidence-based practices.
  - Music therapy aligns with the national effort to reduce opioid dependency and supports use of non-pharmacological therapies.

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Conclusions

- Music therapy is an effect, safe, and low-cost treatment that can be used with traditional pain and anxiety treatment options.
- Music therapy can reduce medication usage and improve patient outcomes.
- Educational intervention increased CRNAs readiness to use music their practice.
- Music therapy supports patient-centered, holistic care.

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