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# The Effects of Music Intervention on Pain and Anxiety in the Immediate Postoperative Period in Adults Undergoing Total Knee Arthroplasty and Total Hip Arthroplasty

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## Background

With the current opioid crisis in the United States, examining adjunct therapies for pain control is an important focus for nursing.

Music has demonstrated its value in treatment of pain in multiple settings including psychiatric medicine, palliative care, neurology and intensive care.

Meta-analyses can be found supporting music intervention in reducing patients' pain and anxiety.

"The Effects of Music Intervention in the Management of Chronic Pain, A Single-Blind, Randomized, Controlled Trial" (Clin J Pain, Vol 00, Number 00, 2011) details the study of Music Care in treating chronic pain patients and states that Music Care as an intervention "appears to be useful in managing chronic pain as it enables a significant reduction in the consumption of medication."

"Music could be offered as a way to help patients reduce pain and anxiety during the postoperative period." A meta-analysis highlights that "music reduced postoperative pain, anxiety and analgesia use and increased patient satisfaction, and that music was effective even when patients were under general anesthetic." (The Lancet, Vol 386, October 24, 2015)

Music Care has developed a software program standardizing a music intervention, thus enabling more methodological rigor in studying music's effects.

## Purpose

This study focused on assessing the effects of using music with elective joint replacement patients in the Post Anesthesia Care Unit (PACU) of Providence Portland Medical Center.

The study used a standardized music intervention throughout the immediate postoperative period to assess its usefulness in reducing acute and/or acute on chronic pain and anxiety.

## Methods

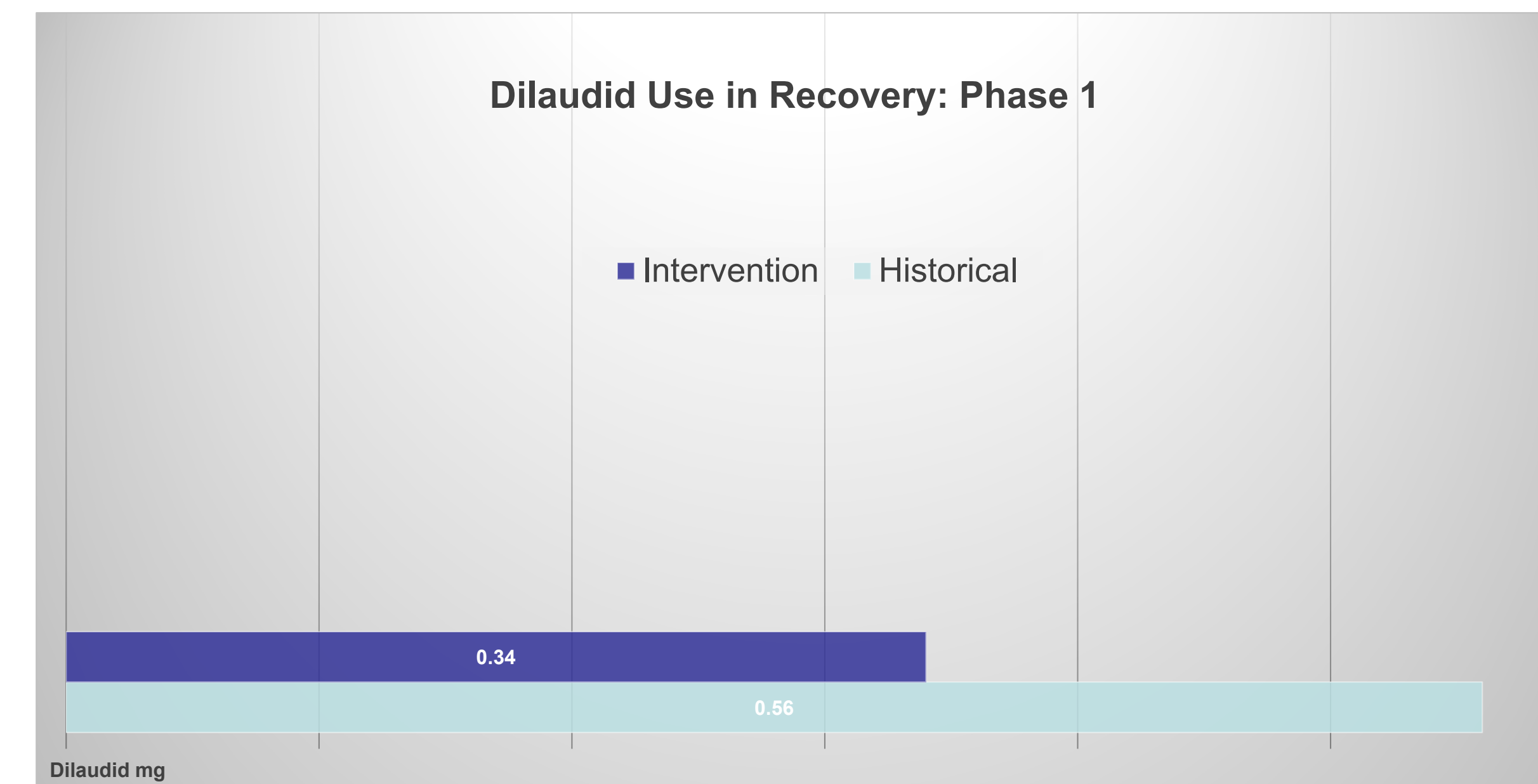
An IRB-approved correlational study using prospective and historical data was conducted.

Study participants included orthopedic surgery patients of Dr. John O'Shea and Dr. Richard Rubinstein who underwent elective knee replacement and patients of Dr. Gustav Fischer who underwent elective knee and hip replacement surgery in the months November and December 2019 and January 2020 through March 2020 at Providence Portland Medical Center.

Historical data was gathered from orthopedic patients of these physicians undergoing elective joint replacements during January, February, March, April and May 2019 at Providence Portland Medical Center.

Historical data from patients was compared with the interventional arm consisting of patients who underwent the same procedures. The music intervention was initiated upon admission to the PACU (Phase 1 of recovery) and discontinued when patients entered Phase 2 of recovery.

Data collected from electronic health records included: vital signs, Pasero Opioid Induced Sedation Scale (POSS), narcotics and benzodiazepines administered and pain ratings. Data was collected throughout the perioperative period, including the preop, intraop and postop Phase 1 and Phase 2 periods.



## Results

There was a statistically significant decrease in the amount of Dilaudid administered in the study participants, with a  $p$  value of 0.03, as well as statistically significant decrease in heart rate ( $p$  value 0.006), respiratory rate ( $p$  value 0.05) and POSS ( $p$  value 0.05). There was no statistically significant difference in the administration of Fentanyl, Oxycodone or Versed, nor in the subjective rating of pain in comparing the 2 groups.

## References

1. "The Effects of Music Intervention in the Management of Chronic Pain, A Single-Blind, Randomized, Controlled Trial" Guetin, Ginies, Siou, Picot, Pommie, Guldner, Gosp, Ostyn, Coudeyre, Touchon (Clin J Pain, Vol 00, Number 00, 2011)
2. "Music as an aid for postoperative recovery in adults: a systematic review and meta-analysis" Hole, Hirsch, Ball, Meads (The Lancet, Vol 386, October 24, 2015)

## Discussion/Conclusions

Music has proven to be a valuable adjunct in managing pain and anxiety in multiple settings. This study showed a statistically significant reduction of Dilaudid administration in patients who had the music intervention during the immediate postoperative period. The study also showed a decrease in heart rate, blood pressure, respiratory rate and POSS with the music intervention.

These findings are important in supporting the use of adjunct therapies for pain control thus decreasing the use of narcotics and their untoward side effects (e.g., decreased respiratory rate, sedation) and related sequelae (e.g., delay in mobility, constipation). A lower POSS and decreased narcotic use may promote early mobility and discharge.

Anecdotally, several patients commented on the comfort of listening to music with noise-cancelling headphones in the PACU. Implications for nursing may include providing soothing background music or other distractions that may help patients relax in a noisy PACU. Of the 50 study participants, 10 requested their own music for the intervention. This implies patients are interested in using a music intervention, but would like more independence in the choice of music.

This study's limitations included the restrictions of music choice and duration as determined by the software from Music Care, as well as the limited recruitment of patients due to the outbreak of Covid19. The study was terminated in March 2020 due to the postponement of elective surgeries and the additional burden to caregivers during the pandemic.

Further research in the use of music throughout the operative experience, including all phases of care, and the use of personal music may be of interest.

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