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## Introduction/Background

Patients undergoing major cancer surgery frequently express increased anxiety about how severe their pain will be and what will be their oncology surgical outcomes. Laparoscopic radical prostatectomy surgery patients have reported severe pain post operatively and experienced psychological distress for potential urinary incontinence and sexual dysfunction. Over this past year, pain management was also identified as the primary cause of patients' increased length of stay in post anesthesia care unit (PACU). The PACU staff conducted a music listening evidence-based practice (EBP) project that recommended investigating complementary music listening methods.

**Null Hypothesis:** There will be no difference in reported anxiety scores and pain scores between intervention groups

## Purpose of the Study

To compare two methods of music listening interventions on anxiety, pain, heart rate, blood pressure, and oxygen saturation among post anesthesia care unit (PACU) patients who are recovering from laparoscopic radical prostatectomy surgeries:

- patient-preferred music listening via Spotify selections; and
- relaxation breathing narrative over minimalistic hypnotic music..

## Methodology

Prospective randomized comparative mixed method study of two non-pharmacologic nursing music listening intervention groups explored effects of music on anxiety and pain management from 2019 to 2020. Group I received patient-preferred music selection via Spotify consisting of assortment of artists. Group II received a narrative of relaxation/breathing exercises with minimalist, hypnotic music. Both groups listened to music before and after surgery.

A power analysis was calculated to have 80% power to detect between-group differences, with Type I error rate of 0.05.

**Inclusion criteria:** 45-80 year old males; all ethnic backgrounds  
**Exclusion criteria:** No visual, hearing, cognitive, or psychiatric deficits

Study recruited 77 male participants who were randomly assigned by a computerized table of random numbers to either the Spotify preferred music selection Group I (n=37) or relaxation breathing instructional narrative with hypnotic music Group II (n=40). Which were prepared in advance with coding placed on serially numbered envelopes containing the research consent, Spielberger STAI-Y questionnaire, and Baseline PACU Data Collection Tool.<sup>12</sup> The envelopes were prepared by a person who was independent to the study and PACU nurses were blinded to the two interventions.

Ethical approval granted by JHMIRB eIRB00200771; Registered Clinical Trial NCT04596917.

## Interventional Music Listening Devices

Apple iPod Touch 32 GB devices were pre-programmed by the hospital IT Department staff to automatically log in to each email account and were set to the following:

Group I was coded as ABA devices—set to Spotify Home screen to play patient's preferred music choices from a search or featured album.

Group II was coded as BAB devices—set to JHH Playlist with one instrumental minimalist track (relaxation and breathing exercises) downloaded on a loop playback.

The pre-programmed iPods used the Maxell Solid2 Black Stereo over ear with noise-canceling Headphones with HygenX, Disposable Ear Covers. Spotify premium account created with x4 unique login emails for each iPod device.

## Procedure/Description of Data Collection

**Procedure:** PACU co-investigators, using a preapproved research recruitment script, called the patients the day prior to their scheduled surgery to invite them to participate in the music listening study.

- Day of surgery, principal investigator/co-investigators consented subjects in waiting room
- Subjects completed Spielberger STAI-Y questionnaire in waiting room
- Patients escorted to Prep Unit (changed into gowns, vital signs, pain scores were obtained)
- Patients listened to assigned music interventions for 15 uninterrupted minutes of music,

**Data Collection:** In PACU, patients listened to assigned interventions after emergence from anesthesia until transfer to inpatient unit. Once discharge criteria met, patients were asked about music listening experience.

## Outcome Measures/ Results

### Quantitative Results

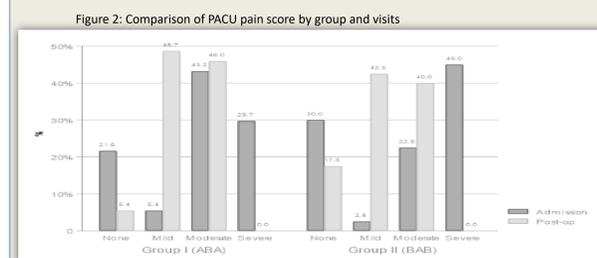
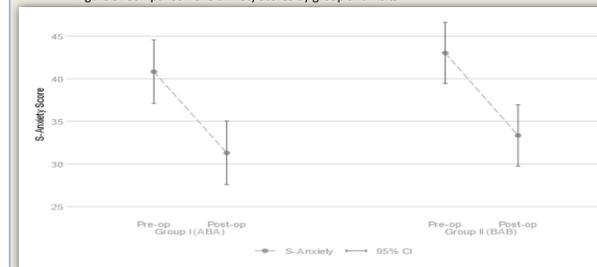


Figure 3: Comparison of S-Anxiety scores by group and visits



### Qualitative Inquiry Results

Themes	Quotes/Stories
Relaxation & Distraction	"It was very relaxing. It was very good. It helped me focus less on my surgery."
	"It was relaxing. Postoperatively, I had some pain, and the music helped with the pain. Music was a distraction. It was very helpful." Patient chose acoustic guitar at first.
	"Music helped me relax especially when I'm left by myself. Very calming. I like it."
	"The relaxation and breathing really helped me in the PREOP before my surgery and especially after surgery. This was very beneficial, as I was very anxious."
Relaxation & Comfort	"I feel relaxed, comfortable, and it helped provide distraction."
	"I found it enjoyable and relaxing because it covered up some of the other noises around here."
	"I like it. It's a pleasant distraction. I think it's helpful."
	"I like it, and it helped me focus on the music and not the surgery."
	"Relaxing. It helped to clear my head."
	"Perfect! Awesome! I listened to music! I wouldn't have made it for three hours without music before surgery. Moderately anxious before surgery." There was a major OR delay > 3 hours. The patient's wife states the patient was, "smiling into the OR."
	"It made me feel relaxed and like I was dancing."
	"Relaxing."
	"I enjoyed the music listening."
	"Worked better for the pain & relaxation"
"Very good and very relaxing with the breathing meditation"	
Relaxation & Comfort	"Awesome! Very relaxing for me! I enjoyed it!"
	"It was soothing."
	"It's very relaxing. I was listening for about 5 minutes and my wife can tell you my HR went down. I never had any pain medications after except my stomach became queasy after drinking water."
	"The relaxation and breathing really helped me in the prep before my surgery and especially after surgery. This was very beneficial as I was very anxious."
	"It was hard to get the iPod working in prep but once he was in PACU he stated, "I loved it; very relaxing. I would recommend to all patients."
	"Helped me a lot POSTOP. It made me relaxed."
	"Relaxing and very comfortable."
	"Very relaxing."
	"I did not hear music; just the breathing techniques and relaxation. It was a good, relaxing experience."

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## Discussion

Pain medication use did not differ between the two groups. Notably, three study participants did not require any pain medication throughout their entire PACU stay. Both interventions reduced STAI scores and pain scores to a similar degree; this reduction was clinically and statistically significant. These interventions should be important complementary techniques for all surgical patients, especially in a busy, fast paced perianesthesia clinical setting.

## Limitations

Single-center study limits generalization; Listening duration difference between 2 groups limits comparability of intervention; Study only included men and not generalizable to women.

## Conclusion

Study revealed both relaxation track and personally selected music can meaningfully improve patients' anxiety and PACU pain scores.

## Implications for Practice

Listening to music is relatively easy to use in many different patient settings. Our findings suggest that music listening is safe, inexpensive, and effective intervention in postop setting. When comparing the cost of the two nursing listening interventions, the relaxation breathing exercises that were pre-recorded over minimalist hypnotic music were a one-time cost and proved to be less costly than the Spotify subscription of \$15.00 per month or \$180.00 annually

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