Evaluating The Success Of Perioperative Self-guided Meditation In Reducing Sleep Disturbance After Total Knee Arthroplasty

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Introduction
- Disruptions in sleep are a frequent complaint after total knee arthroplasty (TKA).
- These disturbances are multifactorial ranging from pain to circadian rhythm disruption.
- Most sleep disturbances improve within 4-6 weeks of surgery but may contribute to the pace and quality of recovery.
- The purpose of this study was to evaluate the effectiveness of self-guided meditation for improving sleep hygiene after TKA.

Methods
- Primary unilateral TKA patients between August 2019 and March 2020 were exposed to a meditation video 2 weeks preop to 2 weeks postop through a patient engagement platform.
- Patients were asked an institutionally designed questionnaire about their sleep patterns (ex. frequency of sleep awakenings, hours spent actually asleep, etc.)
- Two-sample t-tests were performed to compare changes in bedtime, wake-time, total sleep time, and Likert responses for general and pain-related sleep between video and non-video groups.
- Anesthesia, multimodal analgesia, and rehabilitation pathways were standardized.

Intervention
- 9 minute self-guided meditation video consisting of an audio recording with a static image.
- Utilizes a mix of meditation techniques with a focus on breath awareness.
- Patients were instructed to listen to the video 2 times per day during the study period.

Results
- A total of 381 patients (49% female) across 5 surgeons were evaluated. The mean age was 68 years (95% CI: 67.07-68.70).
- There were 40 patients who failed to watch the video completely.
- No associations were found between age, gender, or surgeon and the tested outcome variables. The mean preoperative actual sleep time was 396 minutes (95% CI: 388-440 minutes).
- Postoperatively, the video group improved an average of 52 minutes more than the non-video group (95% CI: 49.8-52.8 minutes), p<0.001.
- Postoperatively, patients tended to shift bedtimes to an earlier hour, but this was not significantly different between groups (p=0.995).
- Wake-times did not alter postoperatively.
- The video group showed significant decreases in sleep awakenings (p=0.001, but not pain-related awakenings (p=0.528).

Discussion
- Sleep hygiene is an important component of TKA recovery.
- The results reveal that adding patient-engagement measures, such as guided self-meditation techniques via video, improves actual hours slept, decreases awakenings, but has little impact on pain-related awakenings.
- The delivery of non-pharmacological interventions, such as meditation, via digital platforms allows for physicians to extend their reach to patients with minimal additional cost or risk to the patient.
- Future studies focusing on long-term benefits of meditation and/or utilizing at-home wearable technologies to obtain objective data could further explore this topic.

References