

BACKGROUND

- High-fidelity simulation (HFS) is commonly used to train anesthesiology learners to manage high-stress situations
- Physiologic stress to HFS can enhance performance in subsequent simulation scenarios, but stress may hinder focus and knowledge retention during post-HFS debrief
- Mindfulness exercises have been suggested to maximize learning and decrease stress/anxiety to improve learning
- Currently, the ideal modality for mindfulness exercises following HFS has been established
- Eyes closed mindfulness exercises are common, but recently virtual reality (VR) guided mindfulness exercise have become more popular

STUDY AIM

- Examine changes in focus, anxiety and EEG patterns in anesthesia residents immediately after a guided mindfulness exercise, with or without VR supplementation

METHODS

- This study was approved by the Institutional Review Board at the Icahn School of Medicine at Mount Sinai.
- Anesthesiology PGY-2 trainees were enrolled in study during the 8 week introduction to anesthesiology boot camp curriculum
- Prior to each HFS, subjects completed baseline anxiety questionnaire (STAI)
- Following twice weekly HFS, subjects completed a 5 minute mindfulness exercise: half using eyes closed and half using immersive VR supplementation (Nature Trek VR [Greener Games], Figure 1)
- All subjects wore a consumer-grade EEG headband to monitor frontal EEG waveforms during the mindfulness exercises

METHODS

- Focus level (VAS 0-100) and focus level (VAS 0-100) were assessed before and after mindfulness sessions and the differences in these values were recorded for each session
- A composite EEG score based on EEG data demonstrating calm or neutral brain states was measured during each mindfulness session for all subjects
- Primary outcome: change in focus (Δ focus)
- Secondary outcomes: change in anxiety (Δ anxiety) and mean composite EEG score per session



Figure 1: Screen shot of immersive virtual reality forest environment

RESULTS

- Twenty-six anesthesiology PGY-2 residents completed the study protocol
- No significant difference in baseline anxiety levels (STAI) were found throughout the study period
- Results for primary and secondary are found in table 1
- Among all subjects, mindfulness exercises resulted in a significant decrease in anxiety levels by 19% ($p < 0.001$). See Figure 2.

	VR	Control	p value
Δ Focus*	+4.8	+8.1	0.43
Δ Anxiety [†]	-16.4	-21.1	0.39
Composite EEG Score [‡]	491.5	489.0	0.96

Table 1: Results for primary and secondary outcomes.

*: mean difference in focus level before and after mindfulness session bases on 0-100 VAS
[†]: mean difference in anxiety level before and after mindfulness session based on 0-100 VAS
[‡]: Mean composite EEG score based on percentage of time in neutral or calm EEG state

RESULTS

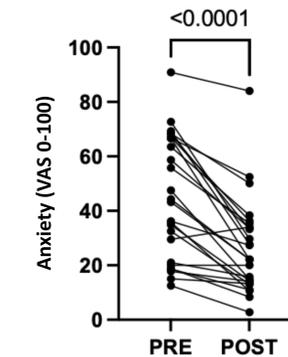


Figure 2: Δ Anxiety for all subjects (VR + Control) showed a significant reduction in anxiety levels regardless of mindfulness modality used

CONCLUSIONS

- The addition of VR had no significant effect on focus, anxiety, or composite EEG scores.
- Among all groups, mindfulness exercises resulted in significantly reduced anxiety levels, suggesting that mindfulness of any form is useful before a HFS debrief

REFERENCES

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