Simulated Out-of-Body Experiences and Perceptions of Death in Integrative Medicine

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Background

- Patients with cancer and other life-threatening diseases regularly contemplate fears and concerns regarding their own mortality.
- The current standard of care in palliative and hospice settings addresses psychosocial and spiritual needs, helping patients find meaning, control, and peace at the end of life[1].
- Virtual reality can drive discussions about patients' lives, including narrative review, emotional processing, theme identification, and end-of-life planning.
- Research has linked simulated out-of-body experiences (OBE) to reducing the user's fear of death and expanding their self-concept[2].
- This study examines the feasibility of VR-simulated OBEs to reduce fear of death. Secondary objectives include assessing their impact on well-being and mortality perceptions, as well as ensuring safety.

Methods

This prospective study consists of two phases:

✓ a *pilot phase* with Cornell University student participants to test the simulation software, procedures, and protocols

❑ a *trial phase* involving non-terminal cancer patients enrolled in Smilow Cancer Hospital's Integrative Medicine program.

The intervention comprises of two phases:

In-Body

The ***in-body* phase** to establish a sense of ownership over a virtual avatar.

Using *ReadyPlayerMe*, participants create a high-quality personalized avatar from a facial scan. They can further customize their avatar to align with physical traits and clothing choice.

Participants are transported to a seated position facing a mirror.

Multisensory synchronization is used to enhance embodiment, including feeling a physical stimulus while observing the same virtual action (i.e. cloth stroked on their hand) . Hand tracking is also used to reinforce the sense of embodiment.

Fig 1. *ReadyPlayerMe* Avatar Creator Interface.

Fig. 2 Participant avatars facing mirror during the in-body phase.

Out-of-Body

The ***out-of-body* phase** simulates the sensation of viewing one's body from above.

User perspective shifts upward and backward, allowing users to view their avatar from an external position.

Users are then transported to an awe-inducing environment accompanied by ambient music.

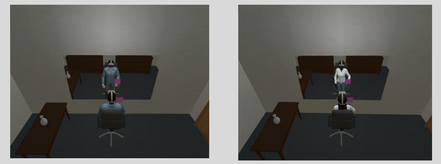

Fig. 3 Participants change perspectives and view their avatars from above in the out-of-body phase.

Fig. 4 Participants viewed a validated 360-degree VR image of an awe-inspiring environment to evoke emotional response[3].

Results

Intervention impact on participants' fear of death and mental well-being is assessed with the *Collett-Lester Fear of Death scale*, *Freiburg Mindfulness Inventory*, and *Ryff Psychological Well Being Scale*.

Preliminary Pilot Data (n=8)

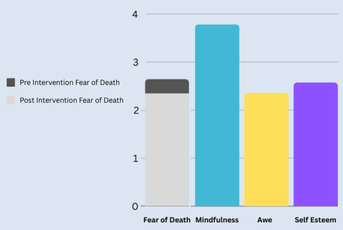

Table 1. Participant response overall averages. Non-significant decrease on fear of death was observed.

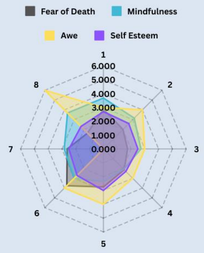

Table 2. Individual participant response scores.

Intervention usability is assessed with validated surveys, including the *System Usability Scale*, *Technology Acceptance Model*, *Multimodal Presence Scale*, and qualitative interviews.

> *Watching my avatar float above the serene, winter mountains was more tranquil … I often turned around and looked downwards to observe my placement in this virtual reality ... I felt quite at peace with myself.*

> *I was able to meditate … just be still for a moment … if the scenery around me was moving it probably would've been more relaxing … [but] overall it was a very good and relaxing experience.*

> *I was in a third person view, where I was looking down on my avatar, but I was still controlling it. My arm movements were still the avatar's, so it was a somewhat trippy experience*

— Participants describing out-of-body phase

Next Steps

- Our preliminary data affirms the feasibility of the intervention, with participants successfully experiencing a VR-induced OBE.
- Qualitative feedback from participants will inform adjustments to the OBE environment and study protocol.
- Analysis in the trial phase will include a full pre- and post-intervention analysis, longitudinal follow up, and expert review of qualitative interview responses.

References

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