The Feasibility & Effectiveness of Meditation Virtual Reality on Reducing Pain for Older Adults with Knee Osteoarthritis

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Introduction

- Urgent need for nonpharmacological pain treatments
- Virtual Reality (VR) shown to be feasible & effective in reducing pain for variety of populations
- Limited evidence & knowledge within occupational therapy (OT) on feasibility of VR for treating older adults’ pain in the clinic
- Preliminary studies with older adults & VR demonstrate minimal side effects, high enjoyment levels, & preference for relaxation with realistic images [1, 2, 4]
- VR enhances meditation for individuals by:
  - distracting individuals from the real world
  - increasing sense of presence
  - providing interesting environment to meditate in [3]
- Purpose: to evaluate feasibility & effectiveness of VR in reducing pain for older adults (60+) with chronic knee osteoarthritis (OA)

Methods

- Participants recruited via Rally (online research recruitment platform), flers in Brigham & Women’s Hospital, Pain Management Center, Tufts Clinical Trials
- Attended single, 60-90 minute on-site study visit to:
  - Engage in 10-minute Guided Meditation VR program w/ guided arm movements
  - Choices provided for music, location, mood
  - Provide data on pain factors, emotional distress, affect, VR experience, & feasibility factors
- Data collected at 3 different time points:
  1. Pre VR: immediately prior to VR (during visit)
  2. Post VR: immediately post VR (during visit)
  3. Follow-up: 24-48 hours post study visit (at home)

*Standardized questionnaires:

- Brief Pain Inventory-Short Form (BPI-SF)
- Pain Catastrophizing Scale (PCS)
- iGroup Presence Questionnaire (IPQ)
- Meditation Experience Questionnaire (MEQ)
- Patient Global Impression of Change (PGIC)
- PROMIS Emotional Distress: Anxiety, Depression, & Anger
- Survey of Pain Attitudes (SOPA)
- User Engagement Scale (UES)

Results

- Mean Pain Intensity Pre VR to Follow Up
- Percentage of Participants Who Experienced 30% or More Reduction in Pain
- Positive and Negative Affect Scale (PANAS) Scores Pre VR to Follow-Up
- Level of Interference due to Pain

Discussion

- Pain:
  - Pain Intensity: significant reduction in overall & knee pain w/ moderate to large effect during VR, post VR, & at follow-up.
  - Highest pain reduction → 73% in knee pain during VR.
  - Pain Interference (the extent to which pain hinders engagement with activities, as well as sleep and enjoyment in life): significant moderate to large decrease for normal work, sleep, & enjoyment of life from baseline to follow-up
- Conclusion: findings suggest VR mediation had moderate-large analgesic effects on pain intensity & pain interference primarily at post VR, with some lasting effects into next day.
- Psychosocial Factors:
  - Affect: significant large decrease in neg. affect pre → post VR, with significant moderate decrease persisting at follow-up
  - Mood: significant moderate decrease in pain interference related to mood pre → follow-up
  - Conclusion: findings suggest VR mediation intervention had positive impact on psychological state related to pain
- Feasibility:
  - Enjoyment: < 50% tried VR before & majority enjoyed experience, using words such as “relaxing” & “captivating”
  - Side Effects: limited simulator sickness symptoms reported
  - Conclusion: older adults had positive VR experience with limited adverse side effects & want to try VR again
- Limitations:
  - small sample size (n=19)
  - single application
  - within-subject design
  - short-term follow-up

Conclusion

- VR further supported as feasible & effective nonpharmacological tool for older adults to treat chronic overall & knee-specific pain
- Older adults may have higher ability to participate in meaningful daily activities up to 24-48 hours after VR meditation
- OTs can utilize innovative & customizable VR technology in OT clinic to provide older adults with additional methods to manage their pain with minimal side effects & high enjoyment levels [1]
- Future direction: rigorous, randomized controlled trials with multiple applications & long-term follow-up needed to better understand analgesic effects & mechanisms behind VR

Participants

- n = 19 older adults (age: 67.9 ± 4.6, min 63-max 77)
- 100% diagnosis of chronic knee osteoarthritis (OA)
- 68.4% female, 84.2% white | 94.7% non-Hispanic
- 3-35 years of chronic pain
- 42.1% of participants used VR before once/twice

94.7% of participants said they wanted to try VR again to treat their pain

Many older adults described their VR experience as...

- captivating, pleasant, relaxing, calming

Directions

- Immediate accessibility & affordability
-毫米-calibrating
- Immediate accessibility & affordability
- Immediate accessibility & affordability

References


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