

Feasibility of Using Vibroacoustic Gamma Stimulation in Advanced Dementia Contexts

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Introduction

- Agitation and aggression are common in persons with dementia¹. Behavioural and psychological symptoms of dementia (BPSD):
 - Reduce quality of life
 - Increase rate of disease progression
 - Increase burden on families and healthcare systems².
- Frequency of BPSD can be attributed by factors such as:
 - Limited cognitive capacity
 - Decreased ability to cope with stressors
 - Impaired communication.
- Non-pharmacologic interventions are suggested as the first line treatment for BPSD and improve the options of effective treatments in the real world.
- Rhythmic sensory stimulation (RSS) is a non-pharmacological approach to treating BPSD:
 - Presumed mechanism of RSS is to induce 40Hz oscillatory patterns in neural activity to improve brain functioning³.
 - Animal research suggests that RSS can alter neurophysiological and cognitive outcomes^{4,5,6}.
- RSS potentially improves cognitive function in persons with Alzheimer's disease⁷.



Source:
<https://unsplash.com/photos/NIHGKAZ3iCI>

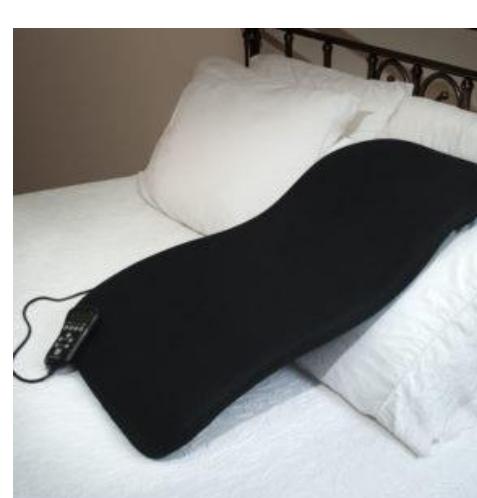
Methodology

Participants

- A sample ($n = 5$) of participants with severe BPSD, who were diagnosed heterogeneously (e.g. Alzheimer's disease, frontotemporal dementia, Lewy body dementia).
 - Eligibility:* Diagnosis of dementia; Presence of severe and/or frequent BPSD (e.g. verbal and physical aggression)
 - Exclusion:* Pre-existing medical conditions that contraindicated RSS (e.g. ergogenic aids, continuous analgesic use)
 - Ethical considerations:* Recruited participants had an assent to participate. Consent for participation was obtained from the Power of Attorney of the prospective participant.

Materials

- Vibroacoustic Chair System (VTS-1000, Sound Oasis, Marblehead, MA)** used for RSS.
 - Audio stimulation:** Energize, Relax, Sleep, or Stress Relief
 - Vibrotactile stimulation:** 1 (lowest) through 20 (highest)



Source:
<https://www.soundoasis.com/vibroacoustic-therapy-back/>

Procedures



Figure 1. Procedure outline of the study

Objectives

- This study tested the feasible use of a portable RSS device on a sample of older adults with severe BPSD receiving treatment in an inpatient hospital unit.
- The tolerability of the RSS device was examined, as indicated by the ability of remain on the device for up to 20 consecutive minutes, for a minimum of 3 sessions.

This work was supported by



Baycrest



Results

Tolerability of interventions

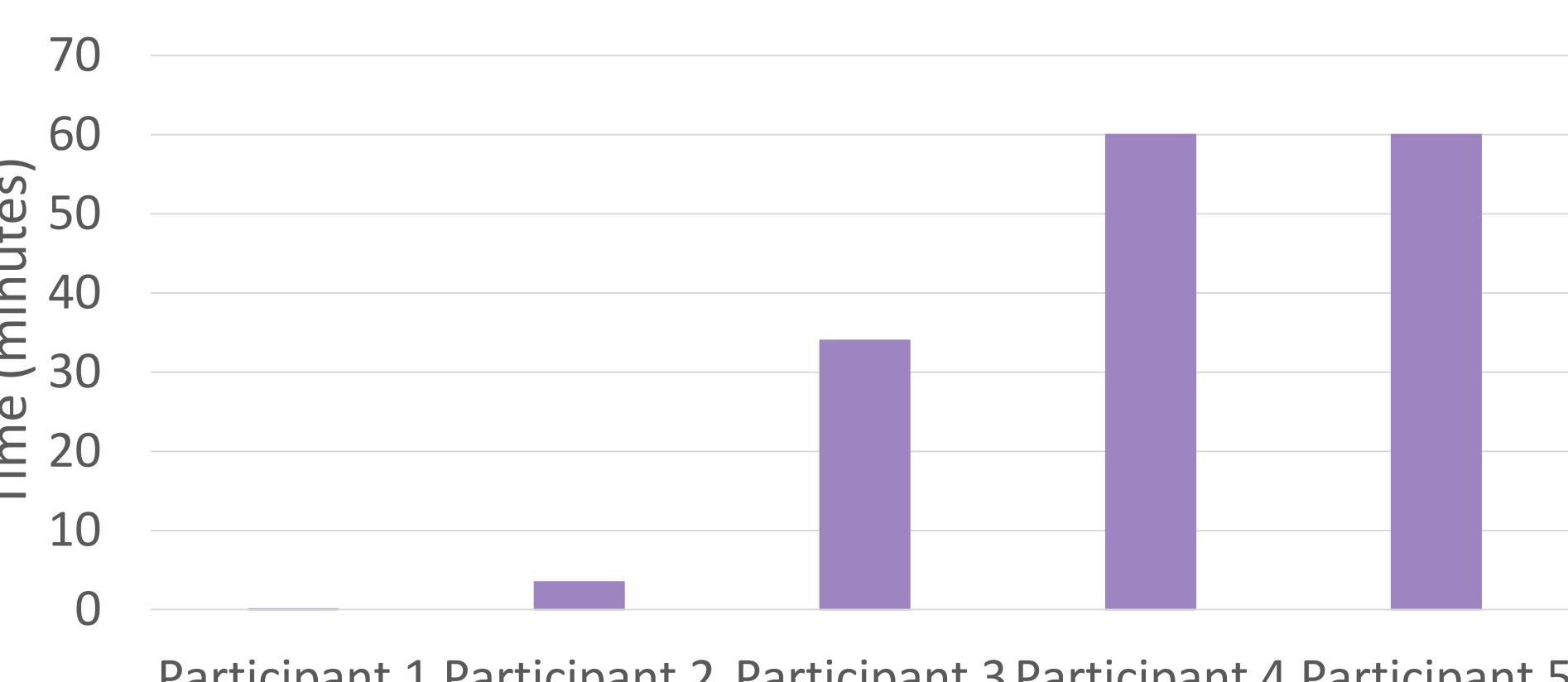


Figure 2. The total time in which participants remained seated in the chair.

Effect of Akathisia

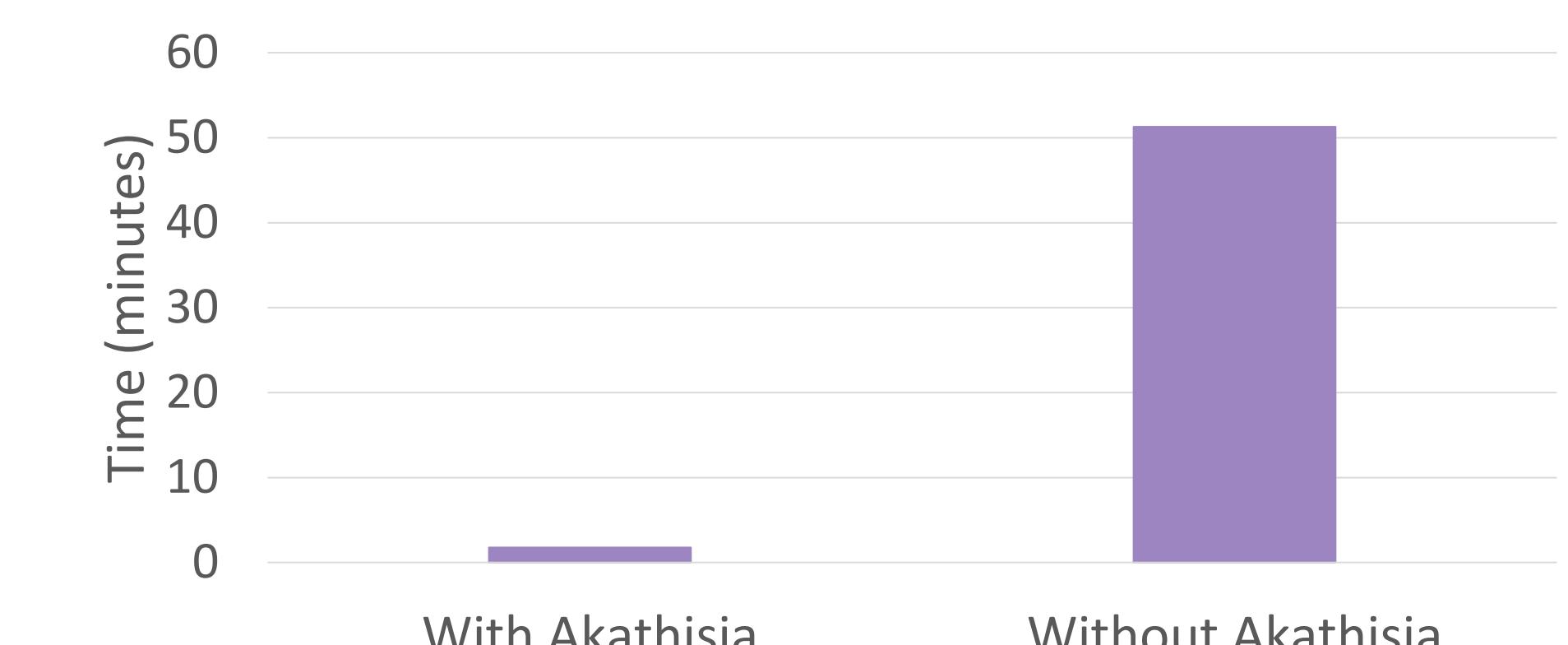


Figure 3. Average time remained engaged with RSS to the presence of akathisia

Measures

- Baseline qualitative descriptions:** At baseline, all participants exhibited frequent and/or severe BPSD, in keeping with eligibility for admission to inpatient treatment.
- Tolerability (qualitative):** No adverse events or significant increases in BPSD (e.g., physical aggression) were observed during the intervention.

Discussion

- Results demonstrated that an RSS intervention using a portable RSS device would be a feasible intervention for BPSD in individuals without akathisia.
- Controlled trials with large samples are justified and will inform the clinical efficacy of RSS in decreasing BPSD in this population.

References

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