



A MUSIC-BASED APP TO COMBAT NEUROPSYCHIATRIC SYMPTOMS OF ALZHEIMER'S DISEASE OR RELATED DEMENTIAS



PennAITech

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BACKGROUND

There are over 6 million people in the US (in NYC - 410,000) who are living with Alzheimer's disease or related dementia, 80% of these individuals are home-based. With ADRD, up to 85% of individuals experience negative symptoms such as agitation and apathy, which can contribute to a decreased quality of life for the individual with ADRD and their family caregiver.

Music-based interventions (e.g., Music Therapeutic Caregiving and indirect music therapy) have been shown to decrease common ADRD behaviors (e.g., agitation and depression) through melody and tempo to balance parasympathetic nerve activity which leads to modulated heart rates, music-induced relaxation/movements, with better mood regulation.

OBJECTIVES / GOALS

People with ADRD and their family caregivers who are home-bound need an easy solution to address neuropsychiatric symptoms to reduce day to day struggles with agitation and apathy related to a diagnosis of dementia.

PILOT PROJECT HIGHLIGHTS

TuneMind will be created to detect heart rates and movements of home based individuals with ADRD and trigger auto-play of personalized songs in a wearable device (e.g., smart watch). Tracking restlessness or periods of stagnation, it will be connected to an accompanying application to store participants' preferred music. Depending on the assessment of an individual's preferred songs and physiological signal response to those songs over time, the app will learn participants' responses and begin to auto-play playlists titrating the music dose based on heart rates and activity levels. Based on the data gathered over time, TuneMind will predict patterns and times of day to play music, pre-empting agitation or extended sedentary periods. The musical experience will be personalized and tailored to either positively stimulate or soothe and relax with the ability for the app to be programmed for use.

SELECTED MILESTONES:

- ✔ Complete interfacing with the smartwatch.
- ✔ Complete embedded anomaly detection module to decode the abnormal patterns of heart rates and movements.
- ✔ *Four dimensions of usability will show acceptable scores.



CONCLUSIONS

TuneMind will predict patterns and times of day to play music, pre-empting agitation or extended sedentary periods. The novelty of our project lies in its ability to extend the evidence-based benefits of music as a therapeutic target to people with ADRD and their caregivers in a home setting. Therefore, the overall impact of this app could prevent or delay pharmacological interventions.

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