SYNOPSIS

# KEY POINT SUMMARY

## OBJECTIVES

The purpose of this study was to examine if a virtual nature experience presented within a memory care unit could reduce stressful emotions of agitation and anxiety among individuals with dementia.

# Can a Virtual Nature Experience Reduce Anxiety and Agitation in People With Dementia?

Reynolds, L., Rodiek, S., Lininger, M., & McCulley, A., 2018 | *Journal of Housing For the Elderly, in press*

## Key Concepts/Context

By 2050, the numbers of individuals in the United States with dementia is projected to be 16 million, with a current cost of care at $259 billion. The majority of individuals with dementia experience stressful emotions of agitation and anxiety, along with associated behaviors, that are challenging for their caregivers. Although there are a variety of care strategies being used, there is lack of consensus and rigorous research to support their effectiveness. A prevalent care strategy is the use of medications, which have associated health risks; therefore, alternative and effective care management strategies are needed. A large body of research has found that viewing nature reduces stress and improves mood in the general population, but few studies have examined the potential of viewing nature for reducing the stressful emotions and associated behaviors experienced by individuals with dementia.

## Methods

Using a counterbalanced design, 14 participants with dementia were exposed three times to a virtual nature experience (treatment) and a generational movie (control). With this design participants served as their own controls, thereby reducing confounding variables. Each of the interventions took place in a 9' x 12' windowless room, set up like a living room on a memory care unit. For the nature experience, plants and two large photographs of landscapes were added. The room had a 65" high definition television, encased by a window frame, to simulate looking out from one's living room. Participants sat within close proximity to the television to create a feeling of immersion in the scene, which research has shown enhances restoration from stress.

To measure participants' response to each of the treatments, heart rate was measured and emotions were measured through observation, using two

observation scales (Observed Emotion Rating Scale & Agitated Behavior Scale), before entering the room and 10 minutes after being in the room. Data were analyzed to see if differences occurred between the treatment and control interventions for heart rate, and to detect emotions including agitation, pleasure, anger, anxiety, sadness, or alertness. Additionally, analysis was done to compare any differences before and after each intervention.

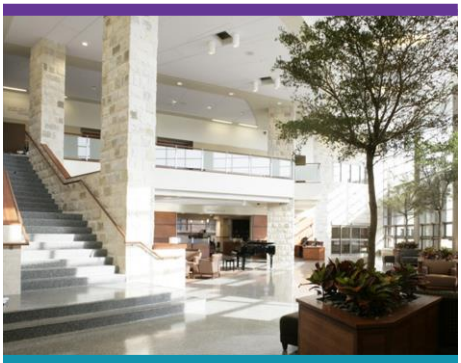
## Findings

With just 10 minutes of exposure, the virtual nature experience significantly reduced heart rate, decreased anxiety, and increased pleasure. Heart rate as a physiologic response to and more discriminate measure of stress decreased an average of 8.5 beats per minute after 10 minutes in the virtual nature experience ($p$=0.03), compared to a decrease of .4 beats per minute after 10 minutes in the generational movie. After 10 minutes, anxiety decreased more in the virtual nature experience from a mean score of 1.9 to 1.5 on a 5-point scale, compared to a decrease in mean scores from 1.5 to 1.4 in the generational movie. Pleasure decreased significantly after 10 minutes of watching the generational movie ($p$=0.04). Though not statistically significant, pleasure increased in the treatment from 3.5 to 3.7 points on a 5-point scale after 10 minutes in the virtual nature experience. Anger and agitation decreased significantly in both interventions ($p$=0.028 and $p$=0.003 respectively).

## Limitations

While the findings of this study are promising, there are limitations that may have affected the study outcomes. While 10 minutes was long enough to see a change in heart rate, it may not have been long enough to see significant changes in observed emotions. Additionally, the ceiling effect of observational scales also could have limited the ability to measure a significant change in emotions during a short interval of time. Eleven of the 14 participants were on medications for care management, and this could have reduced the range of specific emotions exhibited during each intervention, limiting the degree of change. While the small sample size of this study was deliberate for an initial study, this prevents generalizability of the results and likely affected the ability to achieve statistical significance in more of the emotions measured.

The size of the room used for the study made some participants feel uncomfortable, which could have negatively affected emotions. Many participants were aware they were viewing a television screen rather than looking through a window, and therefore perhaps the effect of immersion was not achieved and lessened the positive emotions participants exhibited. Additionally, although the door to the room was kept closed during interventions, it was difficult to prevention interruptions and distractions, which could have affected emotions exhibited. Lastly, perhaps the generational movie was not dissimilar enough to the virtual



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nature experience in the emotions each evoked to produce enough difference interventions.

## Design Implications

While direct contact with nature is always preferable, a virtual nature experience is a cost-effective adjunct for residents of senior living, particularly in memory care, to obtain the health benefits that nature provides. Creating a room or designated space for a virtual nature experience can be fairly easily incorporated into existing facility design and dementia-care programming. With the results of this study, a virtual nature experience holds much potential to serve as an effective alternative to medication use in care management as well as helping to reduce staff stress and improve quality of life for individuals with dementia.