

Study of the effectiveness of the Cognitive Assessment and Memory Program (CAMP) on improvement in cognitive function and mental health for seniors with cognitive decline

Author: Jeb Andrews, PHD, PA-C¹

Abstract

Background

CAMP, the Cognitive Assessment and Memory Program developed by Brighter Days Neuroscience, is a digital therapeutic that employs app-based technology to provide first in class assessment and treatment for mild to moderate cognitive impairment. CAMP is physician ordered, clinician administered, and practitioner monitored, delivered in either an in-patient, out-patient or home health setting. It addresses the problem that as many as 91% of seniors around the world who suffer from cognitive impairment go undiagnosed² and untreated. This problem seems to be largely due to the lack of mainstream screening and preventative care. CAMP seeks to evolve the process of early detection and treatment.

Objective

The objective of this initial study is to determine whether the digital therapeutic Cognitive Assessment and Memory Program (CAMP), as utilized by trained clinicians and coupled with screenings for sleep issues, depression and anxiety, will impact the cognitive function and mental health of seniors with cognitive decline.

Methods

A 16-week prospective, single-arm, pre-post study was conducted on one hundred seventy-one individuals (68% female/32% male, ages

65-86) to measure the change in cognitive function, depression level, anxiety level and sleep quality level of those who participated in the CAMP program. The inclusion criteria were those with a physician diagnosis of cognitive impairment, 65-90 years of age, able to read and write, eligible to receive home health, a score between 11 and 26 on the Mini-Mental State Examination (MMSE) and completion of the 16-week treatment. Participants with visual impairment that required correction with glasses and/or were color-blind were also eligible to participate. The CAMP program was administered by trained clinicians in a home health setting. Participants with a mild to moderate cognitive impairment were referred by a physician for home health. Once referred to home health, the home health clinician administered an in-depth initial assessment as directed via the tablet-based CAMP app to identify the participant's specific cognitive deficits. The cognitive domains assessed were immediate recall (IMI), delayed recall (DMI), auditory memory (AMI), and visual memory (VMI). Based on the results of the initial assessment, custom-tailored cognitive exercises were administered via the CAMP app in the comfort of the participant's home with a trained home health clinician twice a week for 16 weeks. The participants were screened for depression, anxiety, and sleep issues through assessments which included the Participant Health Questionnaire (PHQ-9), the Generalized Anxiety Disorder survey

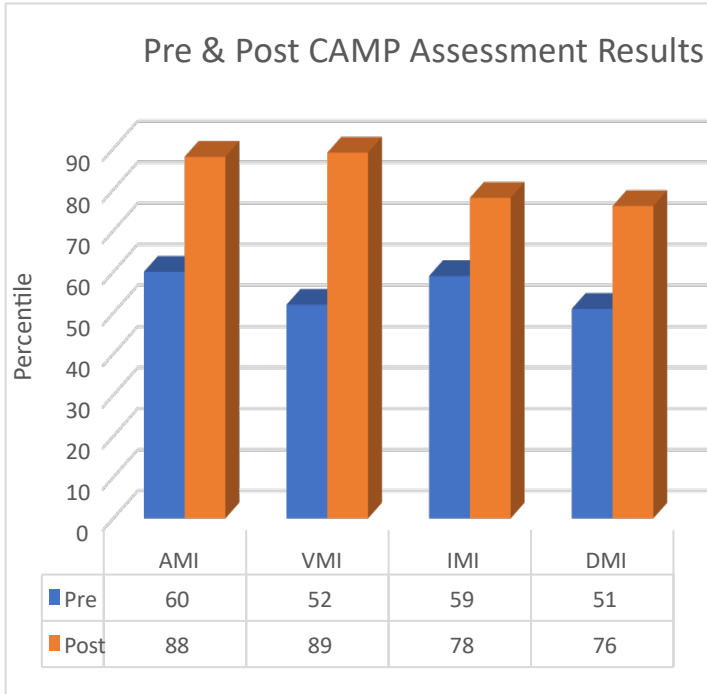
¹ Jeb Andrews is the President of Clinical Trials of America-LA, LLC.

² "Self-Reported Dementia-Related Diagnosis Underestimates the Prevalence of Older Americans Living with Possible Dementia." *J Alzheimer's Dis.* 2021;82(1):373-380. doi.org/10.3233/JAD-201212.

(GAD-7), and the Epworth Sleep Scale at baseline and weeks 8 and 16. In addition, participants were given a biometric armband to track sleep, activity, heart rate, and blood pressure. At the end of week 16, participants were given a MMSE and a post assessment via the CAMP app which was identical to the initial assessment administered at baseline. These results were compiled using 2tailed paired *t* tests and Wilcoxon test with a $p < 0$.

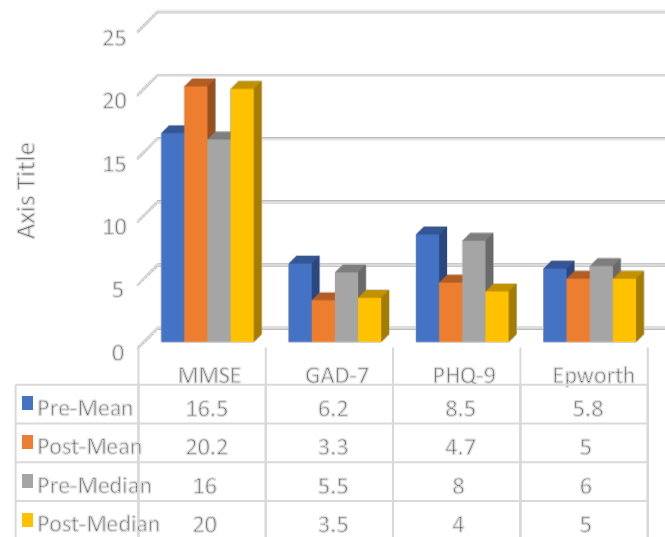
Results

The average initial assessment total index scores were Auditory Memory (AMI): 60, Visual Memory (VMI): 52, Immediate Recall (IMI): 59, and Delayed Recall (DMI): 51. Following completion of the program the post assessment total index scores were AMI: 88, VMI: 89, IMI: 78, and DMI: 76. This represents an average improvement of 27 points in overall memory scores.



Furthermore, at baseline, participants had a mean and median MMSE total index score of 16.5 (SD 3.8) and 16 (IQR=4). Participants experienced a mean and median increase of 3.7 (SD 1.6) and 4 (IQR=3) in MMSE total index score from baseline to week 16

($P < .001$). Participants had a mean and median PHQ-9 score of 8.5 (SD 4.9) and 8 (IQR=6) at baseline and experienced a mean and median decrease of 3.8 (SD 4.1) and 4 (IQR=6) units in PHQ-9 score from baseline to week 16 ($P < .001$). At baseline, participants had a mean and median GAD-7 score of 6.2 (SD 4.5) and 5.5 (IQR=6) and experienced a mean and median decrease of 2.9 (SD 4.1) and 2 (IQR=5) units in GAD-7 score from baseline to week 16 ($P < .001$). Participants had a mean and median Epworth score of 5.8 (SD 4.3) and 6 (IQR=8.5) at baseline and experienced a mean and median decrease of 0.8 (SD 0.8) and 1 (IQR=1) units in Epworth score from baseline to week 16 ($P < .001$).



Conclusion

In this study, seniors with mild to moderate cognitive impairment experienced statistically significant improvements in their cognitive function, sleep, depression, and anxiety levels. These findings serve as initial evidence for the overall feasibility and effectiveness of the CAMP program to improve or maintain cognitive function and mental health in seniors who are experiencing mild to moderate cognitive impairments.