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INTRODUCTION

The U.S. Department of Veteran’s Affairs (VA) reports approximately 80% of all Operation Enduring Freedom (OEF) and Operation Iraqi Freedom (OIF) Veterans experience one or more symptoms consistent with traumatic brain injury (TBI).¹ Common symptoms associated with TBI include problems with goal-setting, organization, self-regulation, memory, and energy conservation/fatigue management. A variety of post traumatic stress disorder (PTSD) symptoms often overlap with TBI-related symptoms, including: memory difficulties, sleep disturbance, social isolation, depression, fatigue, and emotional lability.² Research suggests between 30-50% of OEF and OIF Veterans meet criteria for a comorbid diagnosis of TBI and PTSD.^{3,4} Veterans living with TBI or PTSD often struggle with cognitive and emotional issues that make it difficult for them to transition into civilian life. Smart Device apps can be used to help Veterans compensate for cognitive impairments that limit their functioning in daily activities.^{5,6,7}

PROBLEM

There is limited research that demonstrates Smart Device apps as effective treatment interventions for individuals with cognitive impairments.⁸ As such, clinicians are reluctant to engage Veterans in these contemporary forms of treatment.

PURPOSE OF THE STUDY

This study intends to expand upon findings from previous pilot research and further the nascent body of research regarding the use of smartphone apps as a cognitive prosthetic.⁹

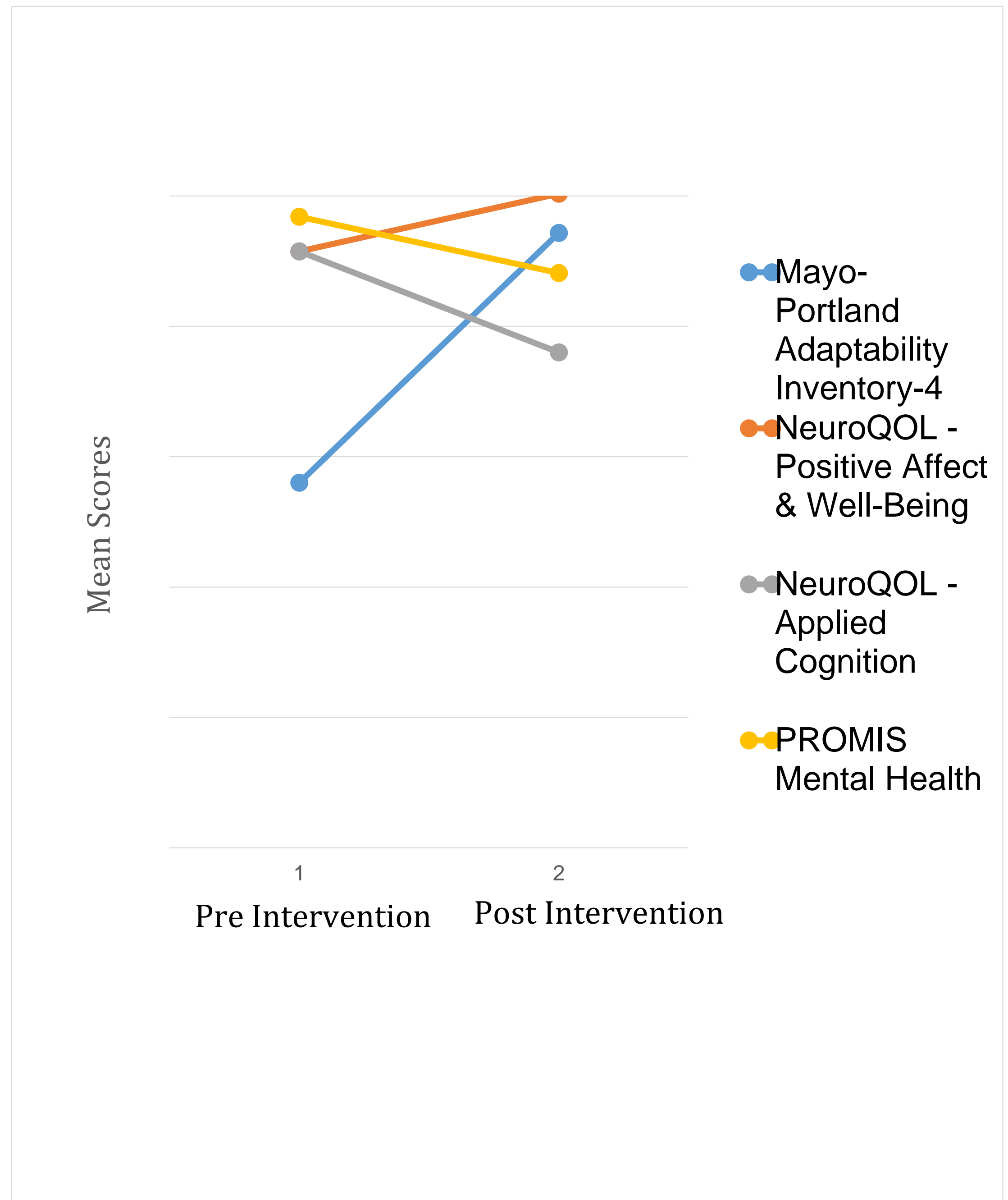
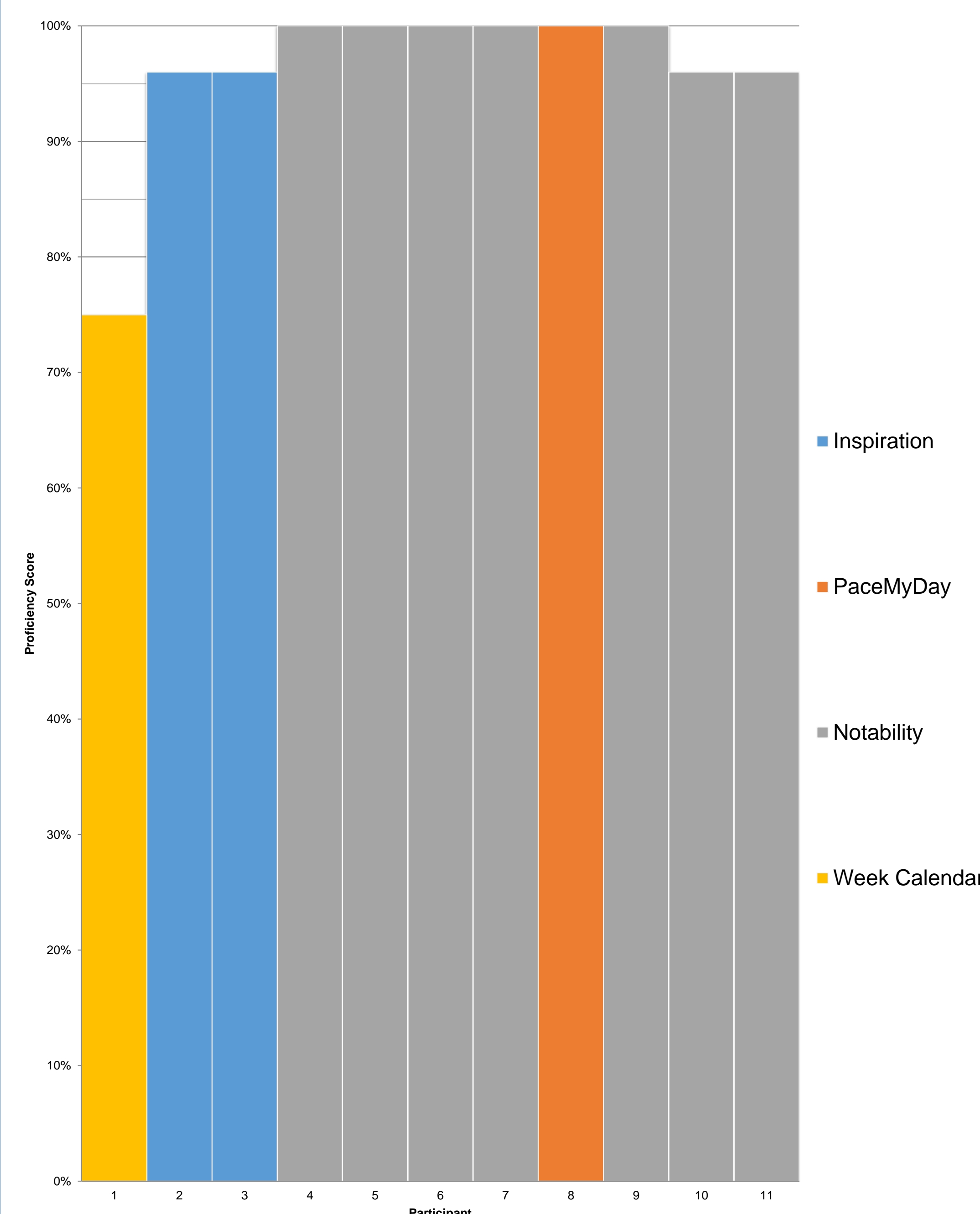
HYPOTHESES

- 1) Veterans with TBI and/or PTSD can effectively learn to use smartphone apps.
- 2) Smartphone apps will be effective in improving functional outcomes.

METHODS

Fifty-eight military veterans and service members (33 males and 25 females; ages 18 to 60) who self-reported as having been diagnosed with TBI and/or PTSD were recruited from Veterans Service Organizations, Veterans Resource Centers, and a number of VA locations in California. Of the 58 participants recruited, 11 participants successfully completed the study which spanned over a 4-week period. In a repeated-measures design, all participants attended an orientation session where they identified one of five Smart Device apps (i.e., PaceMyDay, ReachMyGoals, Notability, Inspiration Maps, and Week Calendar) to use during the study based on self-reported functional challenges. During the orientation session, participants also completed pre-intervention measures and learned how to access the online app training program to learn how to use their chosen apps. Participants were given one week to complete the online app training and a corresponding assessment that helped researchers determine how well participants learned how to use their app. Participants were determined to have reached a level of proficiency in learning to use an app if they scored 70% or higher on the assessment. Participants then had three weeks to practice using their app while submitting a work sample each week. Post-intervention measures were completed at the conclusion of the study. Pre and post intervention measures were comprised of the same set of five outcome measures that evaluated participants in the following areas of functioning: level of disability, quality of life, fatigue, psychosocial functioning, and physical, social, and mental health outcomes.

RESULTS



RESULTS

The results indicated that all 11 participants received proficiency scores of 70% or higher on the post-assessment evaluation, which indicates that they were able to successfully learn how to use their chosen app. In terms of the efficacy of the Smart Device apps on improving functional outcomes, the results suggested that participants experienced a significant increase in overall well-being and life satisfaction. However, there was a significant increase in interference in daily/valued activities. Furthermore, there were significant decreases in cognitive and mental health functioning.

DISCUSSION

Our research demonstrated that veterans with TBI and/or PTSD are able to successfully learn how to use Smart Device apps. Findings regarding the efficacy of Smart Device apps on improving functional outcomes were variable. Although the results indicated that overall well-being and life satisfaction improved with Smart Device app usage, functioning in other areas declined. There were other notable results that were trending toward significance and suggested some improvement in functioning. Specifically, findings suggested a decrease in level of fatigue and an increase in applied cognitive abilities. It may be that with a larger sample size, these trends may result in significant differences. Limitations of the current study include a small sample size. Other limitations include the use of different apps among participants and the lack of a control group. These limitations prevented researchers from determining which app(s) are actually contributing to participants’ change in functioning and limited their ability to draw strong conclusions regarding the efficacy of a specific set of apps in comparison to alternative forms of treatment. Future research should comprise a larger sample of participants and utilize a randomized controlled trial approach with regard to the overall research design. Findings yielded from the present study are intended to inform future studies that evaluate the utility of Smart Device apps as cognitive prosthetics for veterans and service members living with TBI and/or PTSD.