Developing a pilot study to evaluate the feasibility, acceptability, and early efficacy of an intervention to improve cognitive function and quality of life in long COVID-19 patients?

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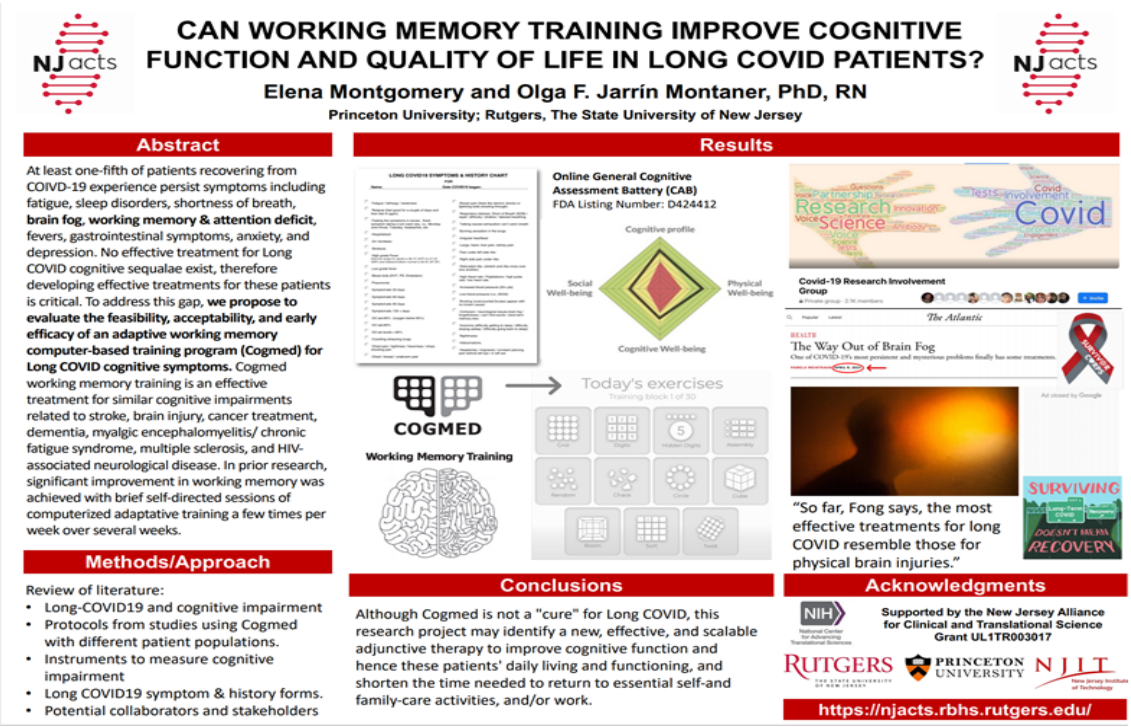
Recently, NIH announced a $1.14 billion investment to identify the causes of Long COVID and to develop ways of treating people who don't fully recover. Approximately one-fifth of patients infected with SARS-CoV-2 continue to experience a constellation of symptoms long after they have recovered from the initial stages of COVID-19 illness. Often referred to as "Long COVID", these symptoms, which may include fatigue, shortness of breath, "brain fog", sleep disorders, fevers, gastrointestinal symptoms, anxiety, and depression, can persist for months and can range from mild to incapacitating. Long COVID is not associated with the severity of SARS-CoV-2 illness, age, or any pre-existing health conditions. The cognitive symptoms of Long COVID are especially burdensome to patients with physical symptoms that limit activity tolerance. For these patients the ability to plan and coordinate assistance needed to complete daily activities and household management is especially critical yet impeded by COVID-induced cognitive deficits. Working memory and attention deficits are common associations of Long COVID. Working memory influences short-term memory and reasoning ability, and thus is an important aspect of cognitive function. To date, no effective treatment and prevention for Long COVID cognitive sequalae exist, therefore developing effective treatments or adjunctive therapy for these patients is critical.

To address this gap, we propose to evaluate the feasibility, acceptability, and early efficacy of an adaptive working memory computer-based training program (Cogmed) for Long COVID cognitive symptoms. Cogmed working memory training is an effective treatment for similar cognitive impairments related to stroke, brain injury, cancer treatment, dementia, myalgic encephalomyelitis/ chronic fatigue syndrome, multiple sclerosis, and HIV-associated neurological disease. In



encephalomyelitis/chronic fatigue syndrome, and HIV-associated neurological disease. In

prior research, significant improvement in working memory was achieved with brief self-directed sessions of computerized adaptative training a few times per week over several weeks. Additionally, patients with myalgic encephalomyelitis/ chronic fatigue syndrome reported a decrease in fatigue, in addition to improvements in cognitive processing speed and executive functioning. Cogmed has not yet been evaluated for its ability to alleviate Long COVID-associated cognitive impairment. Therefore, the aim of this pilot study is to determine whether a 4-week Cogmed working memory training program for Long COVID patients is 1) feasible and acceptable, and 2) may be associated with greater improvement in cognitive functions compared time alone using a wait-list control group. Although Cogmed is not a "cure" for Long COVID, this research project may identify a new, effective, and scalable adjunctive therapy to improve cognitive function and hence these patients' daily living and functioning, and shorten the time needed to return to essential self- and family-care activities, and/or work.