THE EFFECTS OF COVID-19 INFECTION ON COGNITION

Objective
- Determine the post-acute effects of COVID-19 infection on cognitive function
- Compare the cognition of people who have never been infected by COVID-19 with the cognition of people who were infected by COVID-19 longer than three months ago

Patient (COVID-19) group has a mean age of 40 years
Control group has a mean age of 34 years
Patient (COVID-19) group self-reported more difficulties completing IADLs (p=0.03), more symptoms of depression (p=0.02), and more cognitive difficulties (p<0.01)
COVID-19 group had worse performance on some measures of executive function specifically DKEFS Colour-Word Switching performance (p=0.01) and with self-reporting slightly more executive difficulties on the BRIEF MI (p=0.04)
COVID-19 group had very slightly higher scores on a measure of testing effort (evaluated by RAs on RFIT) (p=0.02)
COVID-19 group had significantly higher scores on indicators of symptom invalidity (i.e., answered “yes” to more unrealistic or extremely unlikely neurological and cognitive symptoms) (SIMS) (p<0.01)

Methodology
1. Participants initially complete a 30-45 minute online survey which includes questions regarding:
   - Psychosocial Factors
   - Health
   - Qualtrics
   - Demographic Characteristics
   - Mental health
   - Social networks
   - Resilience
   - Loneliness
   - Personality
   - General health
   - Chronic conditions
   - COVID-19 history
2. Next, participants meet with a Research Assistant (RA) for a teneuropsychology assessment in which the following abilities are tested:
3. Following this, data is entered into a statistics program (SPSS) to conduct analyses. So far the following analyses have been conducted on the preliminary data currently available:
   - T-tests have been used to statistically compare the similarity of demographic and health variables between the patient group (COVID-19) and control group
   - Multivariate analysis of covariance (MANCOVA) has been used to compare cognition, effort testing, and symptom validity between groups while accounting for variation in language ability across groups (as cognitive tests are sensitive to first language status, it is important to control for the potential impact of having a first language other than English)

Preliminary Results
- Patient (COVID-19) group has a mean age of 40 years
- Control group has a mean age of 34 years
- Patient (COVID-19) group self-reported more difficulties completing IADLs (p=0.03), more symptoms of depression (p=0.02), and more cognitive difficulties (p<0.01)
- COVID-19 group had worse performance on some measures of executive function (p<0.02)
  - specifically DKEFS Colour-Word Switching performance (p=0.01) and with self-reporting slightly more executive difficulties on the BRIEF MI (p=0.04)
- COVID-19 group had very slightly higher scores on a measure of testing effort (evaluated by RAs on RFIT) (p=0.02)
- COVID-19 group had significantly higher scores on indicators of symptom invalidity (i.e., answered “yes” to more unrealistic or extremely unlikely neurological and cognitive symptoms) (SIMS) (p<0.01)

Conclusion
- There are few significant differences across groups, these include participants’ scores on some but not all executive function measures as tested by RAs (found to be lower in the COVID-19 group) and the self-reported cognitive function of participants (found to be lower in the COVID-19 group)
- The COVID-19 group participants self-reported experiencing worse cognitive symptoms in comparison to the control group but when tested, the objective performance of cognitive ability was overall very similar between the patient and control groups
- Due to elevated indicators of symptom invalidity (SIMS) in the COVID-19 group, neuropsychology data may be invalid for some participants in this group. As a result, the extent to which their performance on the cognitive tasks can be considered an accurate reflection of their true level of cognitive abilities is uncertain (i.e. subconscious belief that one should not perform well or that one can not do well may be impacting performance during assessment for some participants)

Participants
- A total of 103 participants have been included so far
- This study will continue to recruit participants
- The study’s goal is to include 300 participants (150 in each group)
- 50 participants are so far in the patient group (contracted COVID-19 at least three months previously)
- 53 participants are in the control group (never infected with COVID-19)
- 69.2% of participants so far are female
- Requirements for participation:
  - Must live in BC or Ontario
  - Are 19+ years of age
  - Either (a) never had COVID-19 or (b) contracted COVID-19 at least three months previously

References
T.S.E. Paterson, personal communication, August 15, 2022.