neuropsychological assessment is critical to informing treatment for those experiencing cognitive or functional difficulties post-infection. We aimed to comprehensively evaluate cognitive resiliencies and vulnerabilities of acutely recovered COVID-19 patients, across key domains (i.e., attention, processing speed, language, visuospatial abilities, memory, executive functioning), compared to healthy controls.
Participants and Methods: Adults (N=103; aged 19-85; 69.2% female) who had COVID-19 at least three months prior (n=50) and those with no history of infection (n=53) completed demographic and health questionnaires via Qualtrics, along with measures of depressive (CES-D) and anxiety (GAD-7) symptoms, the Lawton-Brody Instrumental Activities of Daily Living (IADL) Scale, and a measure of subjective cognitive difficulties (SCD-Q). Participants (n=84) completed a teleneuropsychology assessment including a short interview and battery of neuropsychological tests assessing attention (BTA, Digit Span Forward), processing speed (DKEFS Colour Naming & Word Reading, SDMT), language (FAS, Animals, NAB Naming), visuospatial abilities (JLO, RCFT Copy), verbal and visual memory (HVLT-R, NAB Shape Learning, RCFT), and executive function (DKEFS Color-Word Interference & Switching, Digit Span Backward & Sequencing, BRIEF), and including multiple measures of cognitive effort/assessment validity (RFIT, RDS), and a self-report measure of symptom validity (SIMS). T-tests were used to examine demographic and health variables between COVID-19 and control groups. MANCOVA were used to examine group differences across each cognitive domain assessed, and across cognitive effort and symptom validity tasks, while controlling for English language status.
Results: Group comparisons indicated that the COVID-19 group was slightly older (mean age = 40 vs. 34 yrs.; t=-2.101, p=0.04). Those who had COVID-19 reported more difficulties completing IADLs (t=2.204; p=0.03), more depressive symptoms (t=-2.299; p=0.02), and more subjective cognitive difficulties (t=-3.886; p<0.01). Examination of cognitive performance indicated a main effect of prior infection on executive function, controlling for language status (Wilks' Λ=0.817, F(6,73)=2.733, p=0.02). Specifically, having COVID-19 was associated with worse DKEFS Colour-Word Switching performance (p=0.01) and slightly higher self-reported difficulties on the BRIEF MI (p=0.04). No other significant group differences were seen across cognitive domains. There was also a main effect of COVID-19 infection on effort and symptom validity task performance (Wilks' Λ=0.705, F(10,70)=2.923, p<0.01). Specifically, prior infection was associated with higher SIMS Neurologic Impairment (p<0.01) and Amnestic Disorders (p<0.01) subscale scores, and paradoxically, slightly higher RFIT combined scores (p=0.02).
Conclusions: Interestingly, results indicate a significant role for subjective cognitive complaints and potential exaggeration of cognitive symptoms post-COVID-19 infection, in the absence of differences in objective performance in most cognitive domains. While subtle differences are seen on some executive function measures, mean group differences are small, and in the context of higher SIMS subscale scores, may not be readily interpretable. Studies employing similarly comprehensive neuropsychological assessments including validity measures in larger samples are needed to further disambiguate potential objective cognitive performance decrements from subjectively experienced difficulties.

Categories: Infectious Disease (HIV/COVID/Hepatitis/Viruses)
Keyword 1: neuropsychological assessment
Keyword 2: cognitive functioning
Keyword 3: validity (performance or symptom)
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3 Two Dominant Post-COVID Subtypes in Patients Seeking Treatment for "Brain Fog" Through a Post-COVID Treatment Clinic

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Objective: To examine patterns of cognitive function among a clinical sample of patients

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seeking treatment for Post-Acute Sequelae of COVID-19 (PASC).
Participants and Methods: One hundred nineteen patients each completed a baseline neuropsychological evaluation, including clinical diagnostic interview, cognitive assessments, and a comprehensive battery of self-report questionnaires. Patients had a mean age of 50 years (*range*:18 to 74, *SD*=10.1) and a mean of 15.5 years (*SD*=2.54) of formal education. Patients were primarily female (74%) and of White/Caucasian race (75%).
Hierarchical agglomerative clustering was used to partition the data into groups based on cognitive performance. Euclidean distance was used as the similarity measure for the continuous variables and within-cluster variance was minimized using Ward's method. The optimal number of clusters was determined empirically by fitting models with 1 to 15 clusters, with the best number of clusters selected using the silhouette index. All analyses were conducted using the NbClust package, an R package for determining the relevant number of clusters in a data set.
Results: Clustering yielded two distinct clusters of cognitive performance. Group 1 (*n*=57) performed worse than Group 2 (*n*=62) on most cognitive variables (including a brief cognitive screener and tests of attention/working memory, executive function, processing speed, learning and delayed recall). Of note, there were no significant differences between groups on an infection severity scale, hospitalizations/ICU admissions, initial or current COVID-19 symptoms, or prior comorbidities. Groups did not differ in age or gender, but Group 1 had a lower education level than Group 2 (*M*=14.7, *SD*=2.45 vs. *M*=16.2, *SD*=2.42; p=.001). Group 1 also had significantly more minorities than Group 2 (40% vs. 8%; *p*<.001). No other demographic differences (income, living arrangement, or marital status) were observed. In comparison to Group 2 patients, Group 1 patients self-reported significantly higher levels of anxiety and depression and functional impairment (Functional Activities Questionnaire: *M*=11.3, *SD*=8.33 vs. *M*=7.65, *SD*=7.97), perceived stress (Perceived Stress Scale: *M*=24.7, *SD*=7.90 vs. *M*=20.3, *SD*=7.89), insomnia (Insomnia Severity Index: *M*=16.0, *SD*=6.50 vs. *M*=13.1, *SD*=6.76), and subjective cognitive functioning (Cognitive Failures Questionnaire: *M*=58.8, *SD*=16.9 vs. *M*=50.3, *SD*=18.6; *p*'s<.05).
Conclusions: Findings indicate two predominant subtypes of patients seeking treatment for PASC, with one group presenting as more cognitively impaired and reporting greater levels of anxiety, depression, insomnia, perceived stress, functional limitations, and subjective cognitive impairment. Future directions include follow-up assessments with these patients to determine cognitive trajectories over time and tailoring treatment adjuncts to address mood symptoms, insomnia, functional ability, and lifestyle variables. Understanding mechanisms of differences in cognitive and affective symptoms is needed in future work. Limitations to the study were that patients were referred for evaluation based on the complaint of "brain fog" and the sample was a homogenous, highly educated, younger group of individuals who experienced generally mild COVID-19 course.

Categories: Infectious Disease (HIV/COVID/Hepatitis/Viruses)
Keyword 1: cognitive functioning
Keyword 2: neuropsychological assessment
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4 Neurophenotypes and recovery trajectories following laboratory-confirmed SARS-CoV-2 infection

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Objective: Cognitive sequelae are reported in 20-25% of patients following SARS-CoV-2 infection. It remains unclear whether post-infection sequelae cluster into a uniform cognitive syndrome. In this cohort study, we characterized post-COVID neuropsychological outcome clusters, identified factors associated with cluster membership, and examined 6-month recovery trajectories by cluster.

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