

# Creating an Effective Clinic Model for Post-COVID Mental Health Treatment: Results of the Inpatient Outreach Arm

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## Background

- Patients with COVID-19 have increased risk of cognitive and psychiatric sequelae due to intrinsic viral properties, hyperinflammatory state, and increased disposition to ICU level care.
- ICU survivors frequently suffer complications persisting years out from the initial ICU stay with cognitive impairment frequently lasting ~18 months following discharge (Salluh 2015; Sevin, 2018)
- Socioeconomic status likely has an impact on severity of symptoms of COVID-19 and may affect mental health outcomes following viral illness (Dorn, 2020)

## Specific Aims

- To identify psychological and/or cognitive symptoms experienced by this patient population and their relationship to demographic and hospital stay information
- To assess relationships between demographics, hospitalization, and outcomes of outreach screeners
- To assess for differences between those who elected to participate in screening and those who did not

## Methods

### Subjects:

- 100 patients total were screened between Arm 1 and Arm 2
- Participants were either treated for SARS-COV2 at University of Colorado Hospital or referred by their PCP in the CU system, participants tested positive for COVID-19 either during hospitalization or on admission to the hospital

### Study Design:

- The program makes use of two arms:
  - The first assesses those discharged from the hospital using a screener developed by the UCH post-COVID hospitalization program.
  - The second screens patients currently admitted to the hospital with COVID using psychiatric and neurocognitive screeners.
- Both arms allow patients to be referred to Psychiatric Consultation for the Medically Complex clinic (PCMC) for evaluation and treatment.
- Patients were contacted by phone exclusively. Three calls were tried with failed attempt to reach the patient before they were removed from the list.
- The use of an interpreter was utilized for non-English speaking patients.
- Clinic treatment includes pharmaceuticals, individual therapy referral, or referral to the PCMC COVID Survivorship Support Group.

### Screening Tools Used During Inpatient Outreach:

- Hospital Anxiety and Depression Scale (HADS)
- Brief measures of cognition
  - Digit span (to measure attention)
  - Months of the year in reverse (to measure concentration)
  - Verbal Trails B (to measure executive function)

## Results for Inpatient Outreach Arm

Of 50 patients screened in the inpatient outreach arm, 20 were amenable to engaging in surveys to determine benefit of mental health follow up and treatment.

Comparing those that participated to those that didn't, both groups were similar in composition by gender (both **~46% male identifying, 54% female identifying**) and age (**57yo for those that participated, 51 for those who didn't**).

Treatment level, including ICU based care, use of Remdesivir, requiring intubation, noted delirium, hx comorbid mental health treatment, and number medical comorbidities were equivalent between both groups.

They were different by ethnicity, language, and insurance status (Figure 1)

- **54% of those who didn't participate were minorities** vs 20% of those who did participate.
- **75% of those who didn't participate had Medicare** vs 60% in those who did participate
- **21% in the group that did not participate** spoke a language other than English vs 5% in the group that did participate.

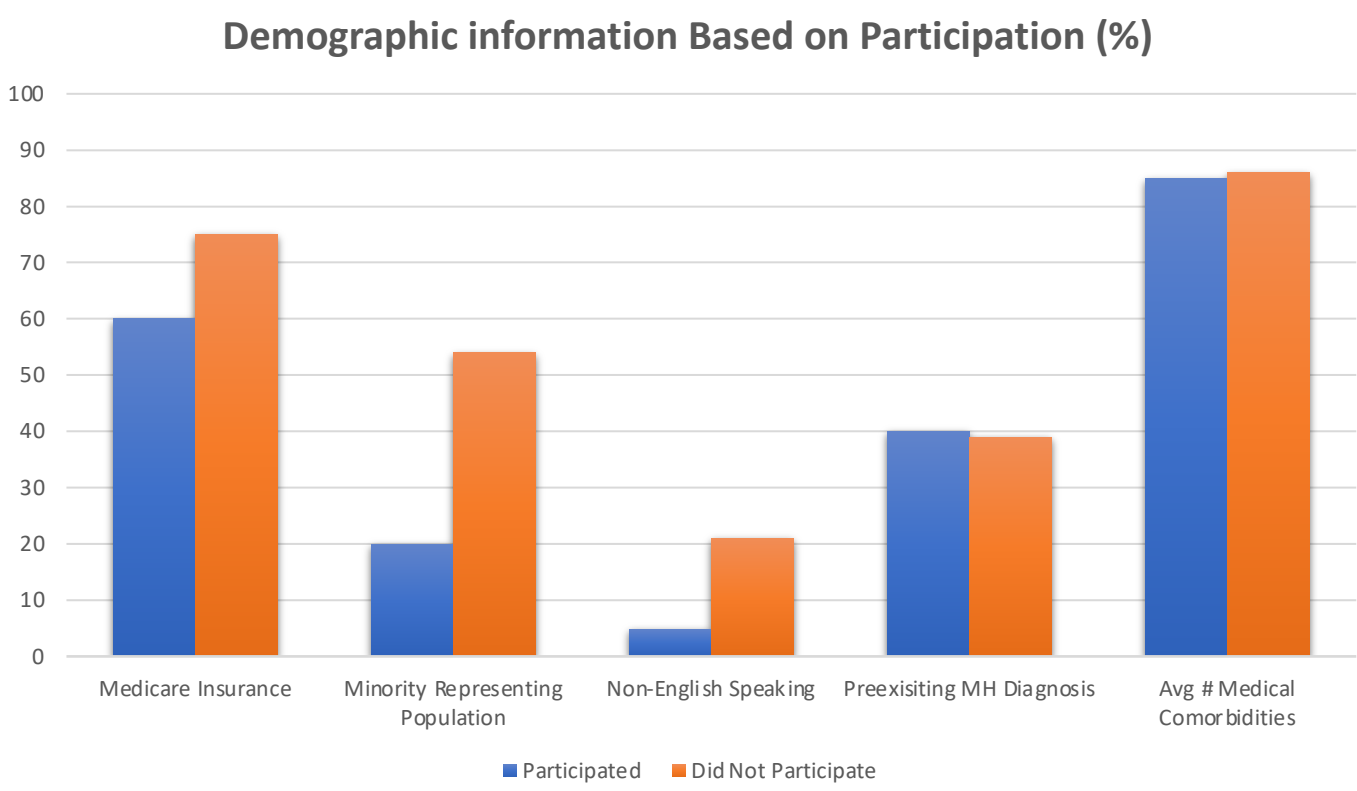


Figure 1

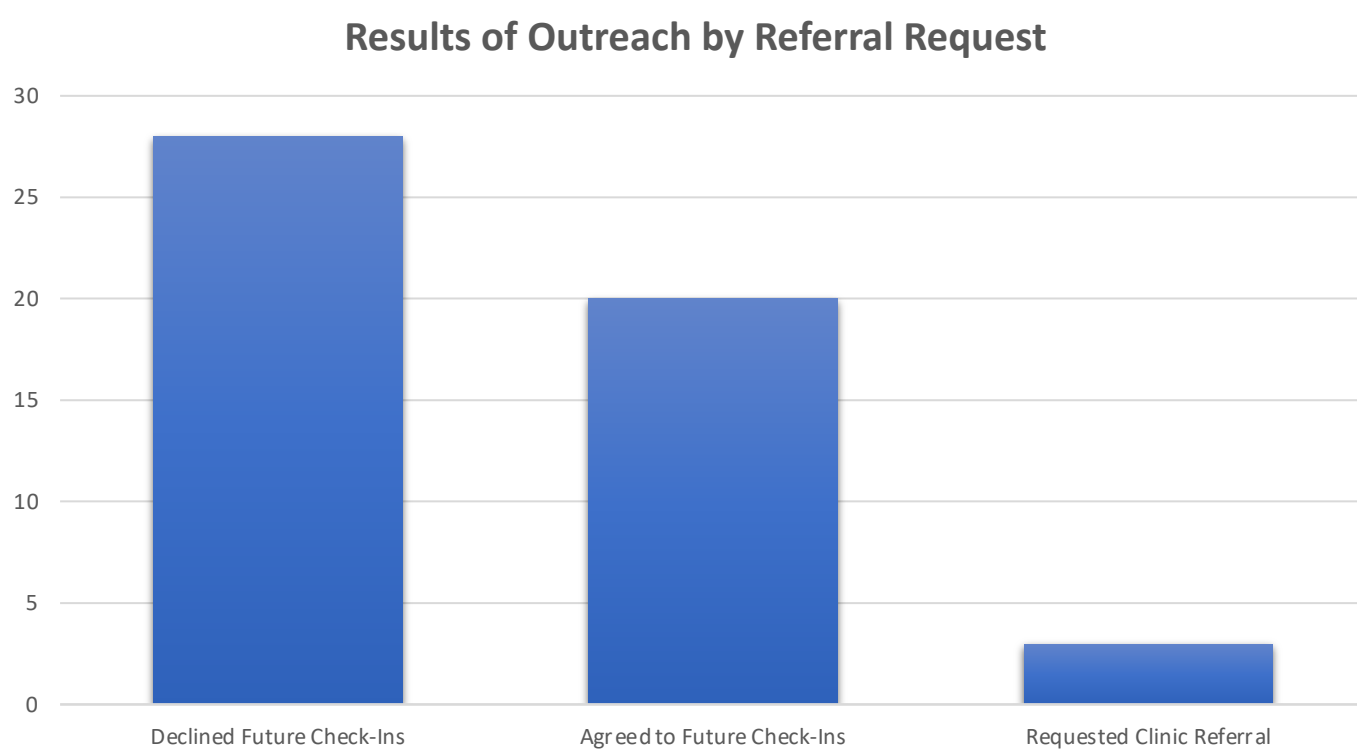


Figure 2

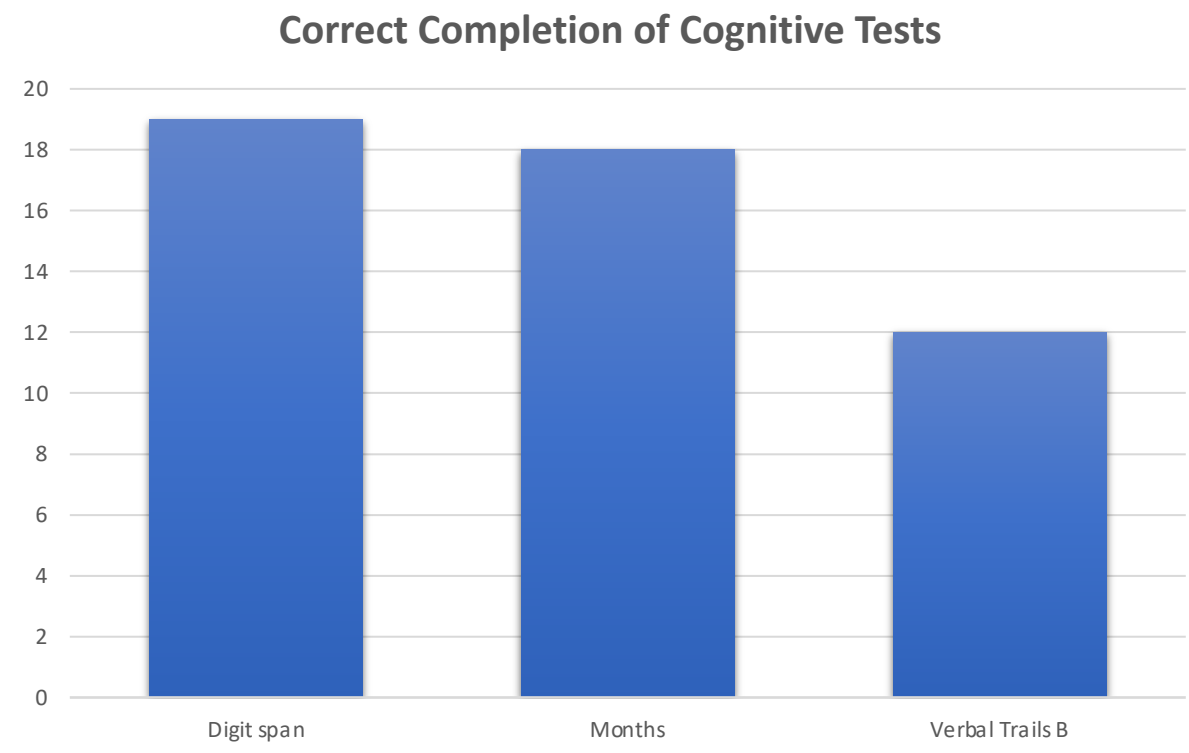


Figure 3

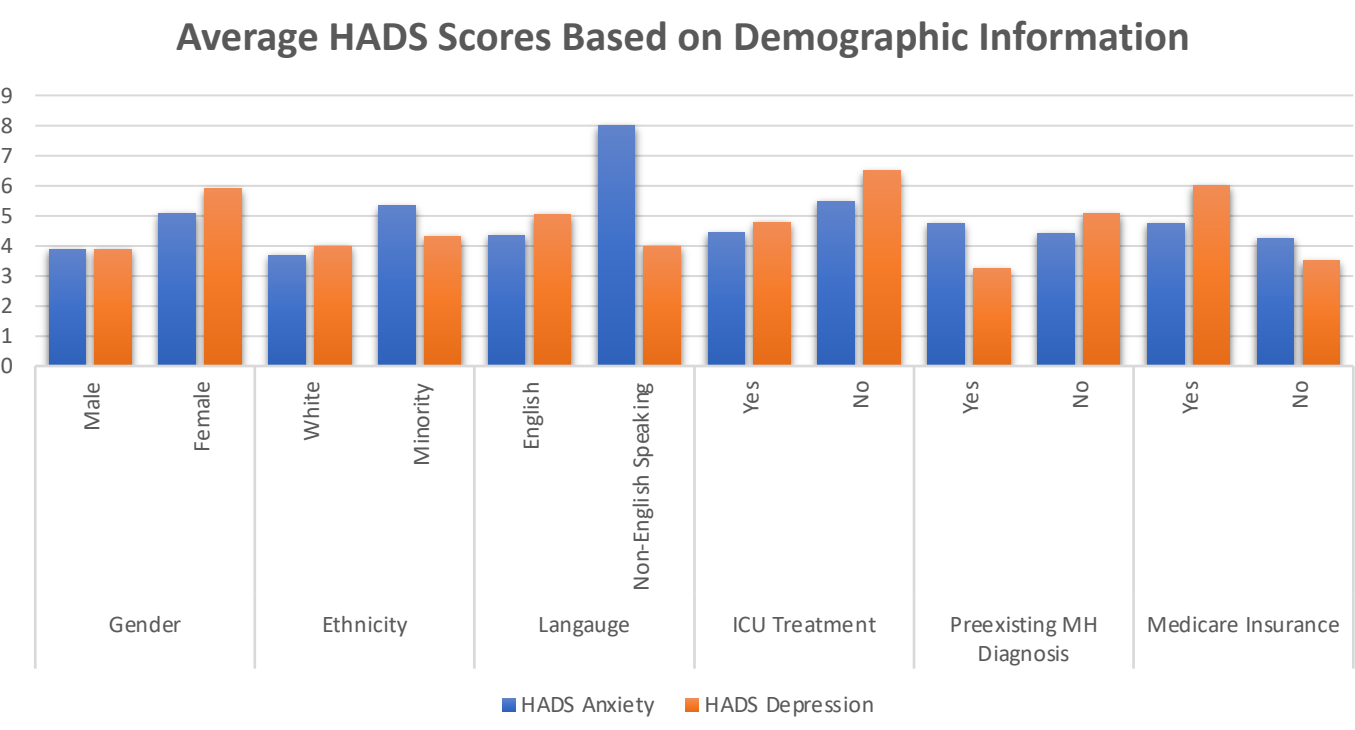


Figure 4

Of 20 patients who completed the screening:

- **3 patients (3%) requested referral** to psychiatry and were seen (Figure 2)
- Cognitive tests: participants performed best on digit span, followed by months in reverse, followed by verbal trails B (missed 3.5x more than the other two tests)
- **40% had difficulty completing Verbal Trails B**, though this was not related to length of hospital stay, type of treatment received, MH comorbidities, or medical comorbidities (comparing by T-test, p >0.05 all comparisons)
- HADS mean scores were not significantly different by gender, age, or ethnicity, in either depression or anxiety (T-test, p >0.05 all comparisons)
- HADS mean scores did show different **trends based on demographics indicative of socioeconomic status** (Figure 4)

## Discussion / Future Steps

### Discussion: Results from Inpatient Outreach

- Given small sample size statistical studies were limited, though several notable patterns emerged.
- There did seem to be a difference in ethnicity, possible socioeconomic status, and primary language when it came to engaging in the study.
- The study population predominantly identified as women and were English speaking, which may reflect population norms for the University of Colorado system.
- In terms of those who participated, HADS scores were not significantly different though scores did trend higher in possibly disadvantaged populations. Further data collection and assessment will need to be accomplished to further discern this trend.
- Though cognitive concerns were significantly voiced during outreach calls, as reflected on cognitive testing, patients typically did not request mental health follow up. Further analysis needs to occur to determine if this may be related to socioeconomic factors.

### Future Steps

- Continue to evaluate risk factors related to demographic and hospital-stay information.
- Increase referral rate from inpatient hospitalization to outpatient clinic, especially for high-risk patients.
- Improve design of clinic to streamline administration of psychological surveys and questionnaires.
- Facilitate incorporation of brief psychological and cognitive screeners into inpatient hospital stay to better track changes in symptomatology following discharge.
- Create new ways of outreaching those most at risk and effectively communicating benefits of psychiatric follow up.

## Acknowledgements

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