Association of Long COVID with Depression among Adults in the United States

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BACKGROUND

- Many adults in the United States (US) experience COVID-19 symptoms that last more than three months known as **Long-COVID.** The prevalence of Long-covid has increased from 15.9% September 2022 to 17.9% in June 2023 then decreased to 15.2% in October 2023.
- Long-COVID may affect mental health, specifically depression through multiple pathways.
- Psychosocial factors such as poor functioning, financial loss, fatigue, sleep disturbances, and cognitive impairment due to long-COVID may lead to poor mental health such as depression.
- Long-COVID itself may cause depression through pathophysiological pathways such as neuroinflammation and autoimmune dysregulation, which can cause damage to the brain. There is a potential for SARS-CoV-2 to injure the brain and contribute to negative psychiatric sequelae.
- Studying the association of long-COVID with depression among adults in the US is important to identify risk factors, develop treatment strategies to support individuals affected by long-COVID, public health planning and resource allocation to ensure access to mental healthcare.

OBJECTIVE

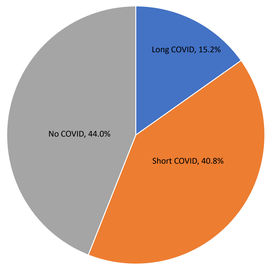
- Examine the association of long-COVID with depression among adults (age ≥ 18 years) in the US using data from the Census Household Pulse Survey (HPS) collected during September 20, 2023 - October 2, 2023.

METHODS

STUDY DESIGN: Cross-sectional; data collected September 20, 2023 - October 2, 2023.
DATA SOURCE: HPS is an online survey conducted by the Census Bureau in collaboration with 16 other federal agencies. HPS is designed to produce national estimates of the impact of the COVID-19 pandemic and other emergent issues on US economy.
STUDY SAMPLE: Adults (age ≥ 18 years) (Unweighted N= 60,308; Weighted N = 197,460,026) ~ 197.5 million
Inclusion Criteria: Participants without missing data long-COVID and depression.
Measures:
Key Independent Variable – Long-COVID: Affirmative answer to a question "Did you have any symptoms lasting 3 months or longer that you did not have prior to having coronavirus or COVID-19? " A list of symptoms were provided to the respondent.
Dependent Variable: Depression was identified using the two-item Patient Health Questionnaire 2 scores (≥ 3). Responses to questions [not at all (0), several days(1), more than half the days (2) and nearly every day (3)] "Little interest or pleasure in doing things" and "Feeling down, depressed or hopeless" in the past weeks were aggregated.
Other explanatory variables: Age, gender, race and ethnicity, martial status, education, poverty status, lost income from employment, food sufficiency, stress due to inflation, insurance, marital status, region, and COVID-19 vaccination.
STATISTICAL ANALYSES: Rao-Scott Chi-square tests and multivariable logistic regression analyses with replicate weights. All analyses were done with SAS 9.4 survey procedures.

RESULTS

Figure 1 - Weighted % of Long-COVID, Adults (age ≥ 18 years)
Census Household Pulse Survey, September 20, 2023 – October 2, 2023



Data Source: https://www.bls.gov/charts/consumer-price-index/consumer-price-index-by-category-line-chart.htm

Figure 2 - Weighted % of Depression Adults (age ≥ 18 years)
Census Household Pulse Survey, September 20, 2023 – October 2, 2023

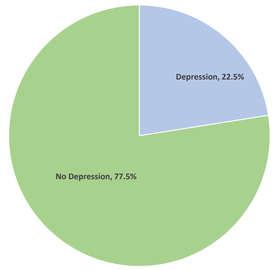


Figure 3 - Weighted % of Depression by Long-COVID
Census Household Pulse Survey, Setember,20 – October 2, 2023

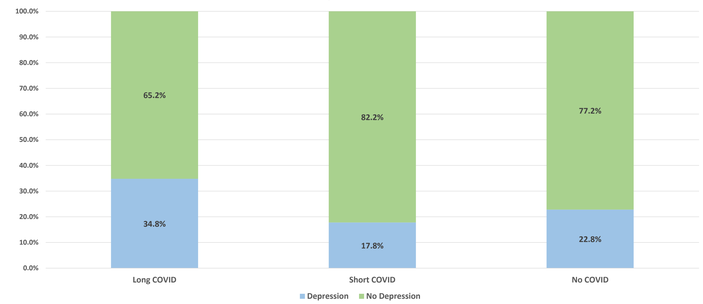
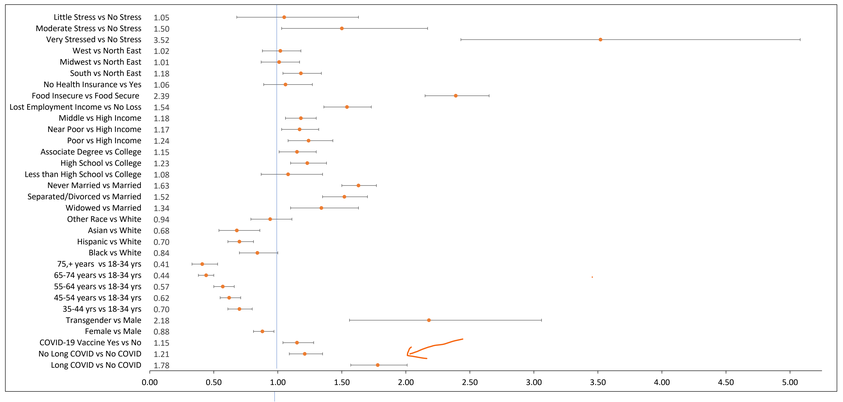


Figure 4: Adjusted Odds Ratios and 95% Confidence intervals from Logistic Regression on Depression
US Adults (Age ≥ 18 years)
Census Household Pulse Survey, Setember,20 – October 2, 2023



RESULTS (Contd.)

- Overall, 15.2% had long-COVID; 40.8% had acute COVID; 44% had no COVID;
- Overall, 22.5% reported depression.
- 83.2% had COVID vaccination. Among adults with COVID-19 vaccination, 15.4% had long-COVID.
- A higher percentage of adults with long-COVID reported depression(34.8% vs 22.8%,p < 0.001)compared to those without COVID.
- After adjustment for other covariates, adults with Long-COVID were more likely to report depression (AOR=1.78, 95%CI=1.57, 2.01) compared to those without COVID.
- Other variables associated with depression included: stress due to inflation, lost employment income, food insufficiency, marital status, poverty, transgender, and COVID-19 vaccination.

DISCUSSION/IMPLICATION

- Our findings from near real-time data may inform public policies to address long-COVID and mental health.
- The COVID-19 pandemic exacerbated an already short supply of therapists, psychologists, psychiatrists and social workers, leading to access barriers.
- Despite the implementation of policies and strategies (example: growth of telehealth), challenges remain.
- As the mental health impact of external shocks outlasts the physical impact, our study findings suggest the demand for mental health care may increase in the coming months, and policies and programs must address both the demand and supply of health care professionals.

CONCLUSION

- Approximately 1 in 5 adults reported depression even after the end of the COVID-19 pandemic.
- Long-COVID was associated with depression.
- Adults with long-COVID may need routine evaluation for major depression and possible mental health treatments.

Strengths and Limitations

Strengths:
- Nationally representative data including diverse populations
- Near real-time data

Limitations:
- The study is cross-sectional.
- Self-reported data are subject to recall bias.
- There may be selection bias because the HPS is an online survey accessible to only those households with at least one email address or cell phone number.
- The data lacked information on chronic conditions and physical health status, which may influence depression.