

Supplementary Material

Article Title: Psychological Challenges of Adults with Severe Mental Illness during the COVID-19 Pandemic

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Supplementary Table 1. Overview of Studies Evaluating Mental Health and the COVID-19 Pandemic (Diagnosis, Exposure, Quarantine/Restrictions)

Source	Design	Population/N	Research Objective(s)	COVID-19 Related Focus	Comparison Group	Outcome Measures	Study Findings
Rogers et al ¹¹	Systematic Meta-Analysis	Various: China, Hong Kong, South Korea, Canada, Saudi Arabia, France, Japan, Singapore, the UK, and the USA.	To examine the two previous coronavirus epidemics, SARS and MERS; to identify the possible psychiatric and neuropsychiatric implications for the current pandemic.	Suspected or diagnosed COVID-19 patients	N/A	COVID-19-related symptoms; number of signs or symptoms; symptom severity (i.e., anxiety, depression, or trauma); proportion of diagnoses (i.e., anxiety, depression, and PTSD)	<p>Signs suggestive of delirium are common in the acute stage of SARS, MERS, and COVID-19; there is evidence of confusion (27.9%; 95% CI 20.5–36.0 of patients), depressed mood (32.6%; 24.7–40.9), anxiety (35.7%; 27.6–44.2) from MERS and SARS, and delirium in 65% of intensive care unit COVID-19 patients.</p> <p>The meta-analysis yielded a point prevalence of depression of 14.9% (95% CI: 12.1%–18.2%; 77 of 517 cases from five studies), anxiety prevalence of 14.8% (95% CI 11.1%–19.4%; 42 of 284 cases from three studies), and post-traumatic stress disorder prevalence of 32.2% (95% CI 23.7–42.0; 121 of 402 cases from four studies).</p>
Brooks et al ⁸	Rapid review	Various	To review the psychological impact of quarantine after infectious disease outbreaks	Quarantine	N/A	Psychological outcomes and symptoms	<p>Having a history of psychiatric illness was associated with experiencing anxiety and anger 4–6 months after quarantine. During the SARS, MERS, and Ebola, outbreaks commonly reported issues included reported boredom, loneliness, anxiety, fear, sadness, depression, stigma, emotional problems, and post-traumatic stress-related symptoms, such as stress, depression, irritability, insomnia, fear, confusion, anger, frustration, boredom, and stigma.</p>

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Taquet et al ¹⁹	Retrospective Cohort	Anonymous health records from 54 healthcare organizations in the US N= 62,365	To estimate the incidence of neurological outcomes in patients diagnosed with COVID-19	Diagnosed COVID-19 Patients	People without a self-reported psychiatric diagnosis	The incidence of neurological outcomes in patients diagnosed with COVID-19	A significantly higher rate of psychiatric disorders was observed among COVID-19 survivors. Within 14-90 days of COVID-19 diagnosis, the HR of incident psychiatric diagnosis was 18.1% (95% CI 17.6-18.6). People with a history of psychiatric illness had an increased risk of COVID-19 after adjusting for other COVID-19 risk factors (RR 1.65, 95% CI 1.59-1.71; p<0.0001).
Taquet et al ²⁰	Retrospective Cohort	Anonymous health records from 54 healthcare organizations in the US N= 236, 379	To estimate the incidence of psychiatric and neurological morbidity 6 months after COVID-19 infection	Diagnosed COVID-19 Patients	All patients hospitalized patients non-hospitalized patients with intensive therapy unit admission	Psychiatric sequelae of COVID-19; psychotic, substance abuse disorders and mood and anxiety disorders	An association between COVID-19 diagnosis and increased incidence of neurological outcomes in the following 6 months after COVID diagnosis was observed (HR 33.62% (95% CI: 33.17–34.07)), but the incidence was higher in patients who were admitted to the intensive therapy unit 46.42% (95% CI: 44.78–48.09)
Lee et al ⁴⁰	Retrospective Cohort	South Korea residents aged 10 years and older who were tested for COVID-19 N= 216 418	To investigate the associations between mental illness and the likelihood of a positive severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2)	Severe clinical outcomes of COVID-19	Patients with no mental illness, patients with any mental illness, and patients with SMI	Clinical COVID-19 outcomes	Patients with a SMI had a slightly higher risk for severe clinical outcomes of COVID-19 than patients without a history of mental illness (OR=3.94,95% CI: 1.73-9.00). Diagnosis of a mental illness was not associated with increased likelihood of testing positive for SARS-CoV-2 (OR 1.00, 95% CI: 0.93–1.08).
Hao et al ¹²	Case-Control	People with depressive or anxiety disorders living in the community; China N= 76 patients with major depression or anxiety disorders and N= 109 controls.	To assess the psychological impact of people with psychiatric illnesses during the peak of 2019 COVID-19 epidemic with strict lockdown measures.	Self-reported COVID-19 symptoms; quarantine; unknown COVID-19 status	Non-psychiatric controls	Impact of Event Scale Revised (IES-R); Depression, Anxiety, and Stress Scale (DASS-21); Post-Traumatic Stress Syndrome (PTSD)	Compared to controls, psychiatric patients scored significantly higher for depression, anxiety, and stress: mean DASS anxiety score = 6.6 vs 1.5, (p < 0.001); mean DASS depression score = 8.3 vs 2.2 (p < 0.001); and mean DASS stress score = 8.0 vs 2.7 (p < 0.001) during the strict lockdown.

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Iasevoli et al ¹³	Case-control	Patients with schizophrenia, bipolar disorder or major depression to non-psychiatric controls in Italy N= 205	To analyze the severity of COVID-19-related perceived stress, anxiety, depressive, and psychotic symptoms	One-month mass quarantine	Non-psychiatric controls	GAD, PHQ9, and PSS	SMI patients had higher mean PSS (16.3 vs 14.1, $p = 0.009$), GAD-7 (6.9 vs 5.5, $t p = 0.01$), and PHQ-9 scores (9.3 vs 6.2, $p < 0.0001$) and SPEQ paranoia subscale scores (10.7 vs 3.8, $p < 0.0001$) compared to healthy controls.
Liu et al ¹⁵	Case-Control	Hubei, China Inpatients with schizophrenia suspected of having COVID-19 (n=21) Inpatients with schizophrenia without symptoms of COVID-19 (n= 30)	To examine the clinical characteristics, laboratory findings and chest CT results of hospitalized patients with schizophrenia with suspected COVID-19 in Hubei	Suspected COVID-19 Diagnosis	Patients who were not suspected of COVID-19	PANSS, PSS, HAMD, HAMA, PSQI	Compared with patients in the non-COVID-19 group (n=21), patients in the COVID-19 suspected group (had higher perceived stress score (PSS) (26.5 vs 11.6, $p < 0.001$), anxiety score (HAM-A) (13.9 vs 2.2, $p < 0.001$), depression score (HAM-D) (14.1 vs 0.4, $p < 0.001$) and sleep quality score (PSQI) (8.0 vs 4.7, $p = 0.005$)
Wang et al ²²	Case-control	United States Nation-wide database of electronic health records of adult patients N= 61 million	To assess the impact of a recent (within past year) diagnosis of a mental disorder, bipolar disorder, depression and schizophrenia – on the risk for COVID-19 infection and related mortality and hospitalization rates	The risk for COVID-19 infection and related mortality and hospitalization rates	Patients with COVID-19 infection but no mental disorder patients with a mental disorder but no COVID-19	The risk for COVID-19 infection and related mortality and hospitalization rates	Patients with a recent diagnosis of a mental disorder had significantly higher odds of COVID-19 infection than patients without a mental disorder, after adjusting for age, sex and ethnicity, with the strongest effect for depression (OR=10.43, 95% CI: 10.10-10.76, $p < 0.001$) and schizophrenia (OR=9.89, 95% CI: 8.68-11.26, $p < 0.001$).
Yang et al ²³	Case-control	Hospitalized COVID-19 patients in Zhejiang, China N= 143 including 26 patients diagnosed with COVID-19 in the isolation ward	To investigate and analyze the psychological status of patients with COVID-19 illness. To explore the effective mode of clinical psychological intervention in isolated acute patients.	COVID-19 isolation	87 patients with general pneumonia in the observation ward (General Pneumonia group) and 30 healthy volunteers (Normal group).	HAM-A and HAM-D	Higher depression ($5.96.52 \pm 3.34$) and anxiety (7.85 ± 2.56) scores were observed in patients with COVID-19 compared with patients without COVID-19 ($p < 0.0001$).

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Bo et al ⁷	Cross-sectional	Quarantine facilities for COVID-19 patients in Wuhan, China N= 730	To examine the pattern of posttraumatic stress symptoms in clinically stable COVID-19 patients.	Diagnosed COVID-19 Patients	N/A	PTSS PTSD Checklist	Most clinically stable COVID-19 patients suffered from significant posttraumatic stress symptoms associated with the COVID-19 prior to discharge. Significant post traumatic stress was evident in 96.2% of patients (95% CI 94.8–97.6%).
Czeisler et al ⁹	Cross-sectional	Adults 18 and older in USA N= 9,896	To estimate the prevalence of mental health outcomes during the COVID-19 pandemic (during June 24–30, 2020)	Symptoms of anxiety disorder and depressive disorder were assessed using the four-item PHQ-9 ^{I*} (4), and symptoms of a COVID-19–related TSRD were assessed using the 6-item IE scale	Stratified by age, race, and ethnicity	Symptoms of adverse mental or behavioral health conditions	Out of 5,470 respondents, 40.9% of U.S adults reported facing mental health conditions. These included symptoms of anxiety disorder or depressive disorder (30.9%), symptoms of trauma and stressor-related disorder (TSRD) related to COVID-19 (26.3%), increased substance use to cope with pandemic-related stress or emotions (13.3%), and seriously considering suicide within the past 30 days (10.7%).
Fisher et al ¹⁰	Cross-sectional	Adults 18 and older in Australia N= 23, 749	To quantify the mental health burden of the most severe COVID-19 related restrictions based on time, location, COVID-19 experience, and sociodemographic	Covid-19-related restrictions	N/A	Effects of COVID-19 restrictions on mental health outcomes PHQ-9 & GAD	The prevalence rates of clinically significant depressive (Odds Ratio (OR) 1.96; 95% CI 1.62; 2.37) and anxiety (OR 1.87; 95% CI 1.53; 2.29) symptoms were substantially and significantly higher in Victoria than in other states and territories.
Gonzalez-Blanco et al ¹¹	Cross-sectional	Spain N= 21, 279	To explore the early psychological impact of the COVID-19 pandemic and the lockdown restrictions in a sample of 21,279 people living in Spain	COVID-19 Lockdown	Healthy controls; people with common mental disorders	COVID-19 Lockdown, DASS-21, IES	People with SMI had statistically significantly higher scores on anxiety, stress, and depression subscales of the DASS-21 compared with the healthy control group, but lower scores compared with the common mental disorders group (all $p < .05$). During the lockdown, people with SMI had higher subscale scores for anxiety (Mean \pm SD = 1.77 ± 1.86), distress (2.40 ± 2.00), and depression (3.96 ± 1.19) compared to healthy controls (p -value = 0.026). However, after adjusting for confounders, anxiety

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							was the only significantly associated psychological variable with lower scores in healthy controls than people with SMI (OR = 0.721; 95% CI: 0.579–0.898).
Rohde et al ¹⁸	Cross-sectional	EHR from five psychiatric hospitals providing inpatient and outpatient treatment in Denmark. N=918 patients. 21% with schizophrenia, 14% with major depression, 7% with bipolar disorder	To assess the impact of COVID-19 on patients across five psychiatric hospitals providing inpatient and outpatient treatment	Pandemic-related psychiatric symptoms	N/A	Pandemic-related psychiatric symptoms	918 patients comprised a Total of 1357 clinical notes. 621 females and 297 males described psychiatric symptoms related to the pandemic. There is an association between the number of COVID-19 cases in Denmark (and the societal restrictions) and the degree of pandemic-related psychopathology (predominantly anxiety, followed by Schizophrenia and related disorders and unspecific stress). Cases of covid-related mental disorders increased after the first case of COVID was identified in Denmark and increased sharply after the implementation of the nationwide lockdown.
Qiu et al ¹⁶	Cross-sectional	36 provinces in China N=52,730	To assess the psychological distress in the general population of China during the COVID-19 epidemic	COVID-19 lockdown	N/A	COVID-19 Peritraumatic Distress Index (CPDI) to measure psychological distress, including the frequency of anxiety, depression, specific phobias, cognitive change, ranging from 0 to 100. A score between 28 and 51 indicates mild	Almost 35% of the respondents experienced psychological distress (29.29% of the respondents' scores were between 28 and 51, and 5.14% of the respondents' scores were ≥ 52). Female respondents showed significantly higher psychological distress than their male counterparts (mean (SD)=24.87 (15.03) vs 21.41 (15.97), $p < 0.001$). People under 18 years had the lowest CPDI scores (mean (SD)=14.83 (13.41)). Individuals between 18 and 30 years of age or above 60 presented the highest CPDI scores (mean (SD)=27.76 (15.69) and 27.49 (24.22), respectively).

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						to moderate distress with a score ≥ 52 indicative of severe distress.	
Vissink et al ²¹	Cross-sectional	Netherlands Hospitalized patients N= 189	To investigate the effects of COVID-19 and restrictive measures among patients with pre-existing psychiatric disorders	COVID-19 outbreak and restrictive measures	Patients with affective disorders	COVID-19 outbreak and restrictive measures, DASS-21, GHQ, BDI, PSWQ	Depressive and anxiety symptoms were more pronounced in affective disorder patients compared to psychotic disorder patients ($p < 0.009$). The COVID-19 outbreak and restrictive measures, such as quarantine and lockdown, impacted people with a pre-existing affective diagnosis more than those with a psychotic diagnosis ($p = 0.046$).

Abbreviations: SMI= Severe Mental Illness, PANSS= Positive and Negative Syndrome Scale, PSS= Perceived Stress Scale, HAMD= Hamilton Depression Rating Scale, HAMA= Hamilton Anxiety Rating Scale, PSQI= Pittsburgh Sleep Quality Index, PTSD= Posttraumatic Stress Disorder, PTSs= Posttraumatic Stress Disorder, DASS-21= Depression, Anxiety, and Stress Scale, IES= Impact of Event Scale, GAD= Generalized Anxiety Disorder, PHQ-9= Patient Health Questionnaire, GHQ= General Health Questionnaire, BDI= Beck Anxiety Inventory, PSWQ= Penn State Worry Questionnaire

