Evidence Brief: Mental Health Outcomes of Adults Hospitalized for COVID-19
Supplementary Materials

July 2021

Prepared for:
Department of Veterans Affairs
Veterans Health Administration
Health Services Research & Development Service
Washington, DC 20420

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U.S. Department of Veterans Affairs
Veterans Health Administration
Health Services Research & Development Service

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SEARCH STRATEGIES

SYSTEMATIC REVIEW SEARCH STRATEGIES

Ovid MEDLINE(R) ALL 1946 to March 16, 2021 **Date Searched: 07-15-20; updated 10-08-20; updated 03-17-21**	
#	**Search Statement**
1	((coronavir* OR corona virus* OR betacoronavir* OR covid19 OR covid 19 OR nCoV OR CoV 2 OR CoV2 OR sarscov2 OR 2019nCoV OR 2019 novel coronavirus* OR 2019 novel CoV OR wuhan virus*) OR ((wuhan OR hubei OR huanan) AND (severe acute respiratory OR pneumonia*))).ti,ab,kw.
2	Coronavirus Infections/ OR Coronavirus/ OR betacoronavirus/ or COVID-19/
3	1 or 2
4	Mental Health/ or exp Mood Disorders/ or exp Depression/ or Depressive Disorder/ or exp Anxiety/ or exp Anxiety Disorders/ or exp Stress Disorders, Traumatic/ or exp Substance-Related Disorders/ or Psychotic Disorders/ or exp Psychotic Affective Disorders/ or exp Hallucinations/ or exp Delusions/ or exp Apathy/ or exp Euphoria/ or exp Aggression/ or exp Personality Disorders/ or exp Schizophrenia/ or exp Mental Disorders/ or exp Obsessive-Compulsive Disorder/ or exp Panic Disorder/ or exp Bipolar Disorder/ or exp Suicide/ or exp Emotions/ or exp Confusion/
5	((mental adj1 health) or mood or depressed or depression or depressive or anxiety or anxieties or anxious or stress disorder or stress disorders or PTSD or post?trauma or post?traumatic or (substance adj1 (abuse or addiction or dependence)) or (drug adj1 (abuse or addiction or dependence)) or psychotic or psychoses or psychosis or schizoaffective or hallucinating or hallucination or hallucinations hallucinated or delusion or delusions or apathy or apathetic or indifference or agitated or agitation or agitations or euphoria or euphoric or elation or elated or disinhibition or disinhibitions or disinhibited or aggression or aggressions or personality or mental or affective or (obsessive adj compulsive) or OCD or panic or neurosis or neurotic or bipolar or mania or manic or suicide or suicidality or suicidal or emotion or tired or confusion or confused).ti,ab,kw.
6	4 or 5
7	exp Hospitalization/ or exp Intensive Care Units/ or Inpatients/ or Subacute Care/
8	(hospital or hospitalized or hospitalization or intensive or ICU or care or post?acute or inpatient or inpatients or admit or admitted or admitting).ti,ab,kw.

9	7 or 8
10	3 and 6 and 9
11	(systematic review.ti. or meta-analysis.pt. or meta-analysis.ti. or systematic literature review.ti. or this systematic review.tw. or pooling project.tw. or (systematic review.ti,ab. and review.pt.) or meta synthesis.ti. or meta-analy*.ti. or integrative review.tw. or integrative research review.tw. or rapid review.tw. or umbrella review.tw. or consensus development conference.pt. or practice guideline.pt. or drug class reviews.ti. or cochrane database syst rev.jn. or acp journal club.jn. or health technol assess.jn. or evid rep technol assess summ.jn. or jbi database system rev implement rep.jn. or (clinical guideline and management).tw. or ((evidence based.ti. or evidence-based medicine/ or best practice*.ti. or evidence synthesis.ti,ab.) and (((review.pt. or diseases category/ or behavior.mp.) and behavior mechanisms/) or therapeutics/ or evaluation studies.pt. or validation studies.pt. or guideline.pt. or pmcbook.mp.)) or (((systematic or systematically).tw. or critical.ti,ab. or study selection.tw. or ((predetermined or inclusion) and criteri*).tw. or exclusion criteri*.tw. or main outcome measures.tw. or standard of care.tw. or standards of care.tw.) and ((survey or surveys).ti,ab. or overview*.tw. or review.ti,ab. or reviews.ti,ab. or search*.tw. or handsearch.tw. or analysis.ti. or critique.ti,ab. or appraisal.tw. or (reduction.tw. and (risk/ or risk.tw.) and (death or recurrence).mp.)) and ((literature or articles or publications or publication or bibliography or bibliographies or published).ti,ab. or pooled data.tw. or unpublished.tw. or citation.tw. or citations.tw. or database.ti,ab. or internet.ti,ab. or textbooks.ti,ab. or references.tw. or scales.tw. or papers.tw. or datasets.tw. or trials.ti,ab. or meta-analy*.tw. or (clinical and studies).ti,ab. or treatment outcome/ or treatment outcome.tw. or pmcbook.mp.))) not (letter or newspaper article).pt.
12	10 and 11
13	limit 12 to english language
14	limit 13 to yr=”2019-Current”

Cochrane Database of Systematic Reviews (CDSR) **Date Searched: 07-15-20; updated 10-08-20; updated 03-17-21**	
#	**Search Statement**
1	((coronavir* OR corona virus* OR betacoronavir* OR covid19 OR covid 19 OR nCoV OR CoV 2 OR CoV2 OR sarscov2 OR 2019nCoV OR 2019 novel coronavirus* OR 2019 novel CoV OR wuhan virus*) OR ((wuhan OR hubei OR huanan) AND (severe acute respiratory OR pneumonia*))).ti,ab,kw.

2	MeSH descriptor: [Coronavirus Infections] explode all trees
3	MeSH descriptor: [Coronavirus] explode all trees
4	MeSH descriptor: [COVID-19] explode all trees
5	{OR #1-#4}
6	MeSH descriptor: [Mental Health] explode all trees
7	MeSH descriptor: [Mood Disorders] explode all trees
8	MeSH descriptor: [Depression] explode all trees
9	MeSH descriptor: [Depressive Disorder] explode all trees
10	MeSH descriptor: [Anxiety] explode all trees
11	MeSH descriptor: [Anxiety Disorders] explode all trees
12	MeSH descriptor: [Stress Disorders, Post-Traumatic] explode all trees
13	MeSH descriptor: [Substance-Related Disorders] explode all trees
14	MeSH descriptor: [Psychotic Disorders] explode all trees
15	MeSH descriptor: [Affective Disorders, Psychotic] explode all trees
16	MeSH descriptor: [Hallucinations] explode all trees
17	MeSH descriptor: [Apathy] explode all trees
18	MeSH descriptor: [Euphoria] explode all trees
19	MeSH descriptor: [Aggression] explode all trees
20	MeSH descriptor: [Personality Disorders] explode all trees
21	MeSH descriptor: [Schizophrenia] explode all trees
22	MeSH descriptor: [Mental Disorders] explode all trees
23	MeSH descriptor: [Obsessive-Compulsive Disorder] explode all trees
24	MeSH descriptor: [Panic Disorder] explode all trees
25	MeSH descriptor: [Bipolar Disorder] explode all trees

26	MeSH descriptor: [Suicide] explode all trees
27	MeSH descriptor: [Emotions] explode all trees
28	MeSH descriptor: [Confusion] explode all trees
29	((mental NEXT health) or mood or depressed or depression or depressive or anxiety or anxieties or anxious or stress disorder or stress disorders or PTSD or post?trauma or post?traumatic or (substance NEAR/1 (abuse or addiction or dependence)) or (drug NEAR/1 (abuse or addiction or dependence)) or psychotic or psychoses or psychosis or schizoaffective or hallucinating or hallucination or hallucinations hallucinated or delusion or delusions or apathy or apathetic or indifference or agitated or agitation or agitations or euphoria or euphoric or elation or elated or disinhibition or disinhibitions or disinhibited or aggression or aggressions or personality or mental or affective or (obsessive NEXT compulsive) or OCD or panic or neurosis or neurotic or bipolar or mania or manic or suicide or suicidality or suicidal or emotion or tired or confusion or confused).ti,ab,kw
30	{OR #6-#29}
31	MeSH descriptor: [Hospitalization] in all MeSH products
32	MeSH descriptor: [Intensive Care Units] explode all trees
33	MeSH descriptor: [Inpatients] explode all trees
34	MeSH descriptor: [Subacute Care] explode all trees
35	((hospital or hospitalized or hospitalization or intensive or ICU or care or post?acute or inpatient or inpatients or admit or admitted or admitting)):ti,ab,kw
36	{OR #31-#35}
37	#5 AND #30 AND #36

Date Searched: 07-15-20; updated 10-08-20; updated 03-17-21	
Database/Resource	**Search Terms/Relevant Results**
Cochrane COVID Rapid Reviews	https://www.cochranelibrary.com/covid-19#Rapid%20reviews Search terms: mental health
CEBM Oxford COVID-19 Evidence Service	https://www.cebm.net/covid-19/ Search terms: mental health
CADTH	https://covid.cadth.ca/ Search terms: mental health
McMaster University National Collaborating Centre for Methods and Tools	https://www.nccmt.ca/knowledge-repositories/covid-19-evidence-reviews Search terms: mental health
VA ESP COVID-19 Evidence Reviews	https://www.covid19reviews.org Search terms: mental health

PRIMARY LITERATURE SEARCH STRATEGIES

Ovid MEDLINE(R) ALL 1946 to March 16, 2021 **Date Searched: 07-15-20; updated 10-08-20; updated 03-17-21**	
#	**Search Statement**
1	(coronavir* OR corona virus* OR betacoronavir* OR covid19 OR covid 19 OR nCoV OR CoV 2 OR CoV2 OR sarscov2 OR 2019nCoV OR 2019 novel coronavirus* OR 2019 novel CoV OR wuhan virus*) OR ((wuhan OR hubei OR huanan) AND (severe acute respiratory OR pneumonia*)).ti,ab,kw.

2	Coronavirus Infections/ OR Coronavirus/ OR betacoronavirus/ or COVID-19/
3	1 or 2
4	Mental Health/ or exp Mood Disorders/ or exp Depression/ or Depressive Disorder/ or exp Anxiety/ or exp Anxiety Disorders/ or exp Stress Disorders, Traumatic/ or exp Substance-Related Disorders/ or Psychotic Disorders/ or exp Psychotic Affective Disorders/ or exp Hallucinations/ or exp Delusions/ or exp Apathy/ or exp Euphoria/ or exp Aggression/ or exp Personality Disorders/ or exp Schizophrenia/ or exp Mental Disorders/ or exp Obsessive-Compulsive Disorder/ or exp Panic Disorder/ or exp Bipolar Disorder/ or exp Suicide/ or exp Emotions/ or exp Confusion/
5	((mental adj1 health) or mood or depressed or depression or depressive or anxiety or anxieties or anxious or stress disorder or stress disorders or PTSD or post?trauma or post?traumatic or (substance adj1 (abuse or addiction or dependence)) or (drug adj1 (abuse or addiction or dependence)) or psychotic or psychoses or psychosis or schizoaffective or hallucinating or hallucination or hallucinations hallucinated or delusion or delusions or apathy or apathetic or indifference or agitated or agitation or agitations or euphoria or euphoric or elation or elated or disinhibition or disinhibitions or disinhibited or aggression or aggressions or personality or mental or affective or (obsessive adj compulsive) or OCD or panic or neurosis or neurotic or bipolar or mania or manic or suicide or suicidality or suicidal or emotion or tired or confusion or confused).ti,ab,kw.
6	4 or 5
7	exp Hospitalization/ or exp Intensive Care Units/ or Inpatients/ or Subacute Care/
8	(hospital or hospitalized or hospitalization or intensive or ICU or care or post?acute or inpatient or inpatients or admit or admitted or admitting).ti,ab,kw.
9	7 or 8
10	3 and 6 and 9
11	limit 10 to english language
12	limit 11 to yr="2019-Current"

WHO COVID-19 Database **Date searched: 07-15-20; updated 10-08-20; updated 03-17-21**	
#	**Search Statement**

1	mental health or mood or depressed or depression or depressive or anxiety or anxieties or anxious or stress disorder or stress disorders or PTSD or post-trauma or post-traumatic or substance abuse or substance addiction or substance dependence or drug abuse or drug addiction or drug dependence or psychotic or psychoses or psychosis or schizoaffective or hallucinating or hallucination or hallucinations hallucinated or delusion or delusions or apathy or apathetic or indifference or agitated or agitation or agitations or euphoria or euphoric or elation or elated or disinhibition or disinhibitions or disinhibited or aggression or aggressions or personality or mental or affective or obsessive compulsive or OCD or panic or neurosis or neurotic or bipolar or mania or manic or suicide or suicidality or suicidal or emotion or tired or confusion or confused (Title, abstract, subject)
2	hospital or hospitalized or hospitalization or intensive or ICU or care or post-acute or post acute or inpatient or inpatients or admit or admitted or admitting (Title, abstract, subject)
3	1 and 2
4	limit 3 to english language

EBSCOhost APA PsycINFO **Date Searched: 07-15-20; updated 10-08-20; updated 03-17-21**	
#	**Search Statement**
1	TI (((coronavir* OR corona virus* OR betacoronavir* OR covid19 OR covid 19 OR nCoV OR CoV 2 OR CoV2 OR sarscov2 OR 2019nCoV OR 2019 novel coronavirus* OR 2019 novel CoV OR wuhan virus*) OR ((wuhan OR hubei OR huanan) AND (severe acute respiratory OR pneumonia*)))) OR AB (((coronavir* OR corona virus* OR betacoronavir* OR covid19 OR covid 19 OR nCoV OR CoV 2 OR CoV2 OR sarscov2 OR 2019nCoV OR 2019 novel coronavirus* OR 2019 novel CoV OR wuhan virus*) OR ((wuhan OR hubei OR huanan) AND (severe acute respiratory OR pneumonia*)))) OR KW (((coronavir* OR corona virus* OR betacoronavir* OR covid19 OR covid 19 OR nCoV OR CoV 2 OR CoV2 OR sarscov2 OR 2019nCoV OR 2019 novel coronavirus* OR 2019 novel CoV OR wuhan virus*) OR ((wuhan OR hubei OR huanan) AND (severe acute respiratory OR pneumonia*))))
2	DE "Coronavirus" OR DE “COVID-19”
3	S1 or S2
4	((((((((((((((((((DE "Mental Health" OR DE "Mental Status") OR (DE "Affective Disorders" OR DE "Disruptive Mood Dysregulation Disorder" OR DE "Major Depression")) OR (DE "Major Depression" OR DE "Anaclitic Depression" OR DE

	"Dysthymic Disorder" OR DE "Endogenous Depression" OR DE "Reactive Depression" OR DE "Recurrent Depression" OR DE "Treatment Resistant Depression")) AND (DE "Anxiety" OR DE "Anxiety Sensitivity" OR DE "Death Anxiety" OR DE "Health Anxiety" OR DE "Social Anxiety" OR DE "Anxiety Disorders" OR DE "Generalized Anxiety Disorder" OR DE "Obsessive Compulsive Disorder" OR DE "Panic Attack" OR DE "Panic Disorder" OR DE "Phobias" OR DE "Separation Anxiety Disorder" OR DE "Trichotillomania")) OR (DE "Posttraumatic Stress Disorder" OR DE "Complex PTSD" OR DE "DESNOS")) OR (DE "Substance Use Disorder" OR DE "Addiction" OR DE "Alcohol Use Disorder" OR DE "Cannabis Use Disorder" OR DE "Drug Abuse" OR DE "Drug Dependency" OR DE "Inhalant Abuse" OR DE "Opioid Use Disorder" OR DE "Tobacco Use Disorder")) OR (DE "Psychoticism")) AND (DE "Acute Psychosis" OR DE "Acute Schizophrenia" OR DE "Acute Schizophrenia" OR DE "Acute Stress Disorder")) OR (DE "Hallucinations" OR DE "Auditory Hallucinations" OR DE "Hypnagogic Hallucinations" OR DE "Visual Hallucinations")) OR (DE "Delusions")) OR (DE "Apathy")) OR (DE "Euphoria")) AND (DE "Aggressive Behavior" OR DE "Attack Behavior" OR DE "Coercion" OR DE "Conflict" OR DE "Microaggression" OR DE "Relational Aggression" OR DE "Threat" OR DE "Aggressiveness")) OR (DE "Personality Disorders" OR DE "Antisocial Personality Disorder" OR DE "Avoidant Personality Disorder" OR DE "Borderline Personality Disorder" OR DE "Dependent Personality Disorder" OR DE "Histrionic Personality Disorder" OR DE "Narcissistic Personality Disorder" OR DE "Obsessive Compulsive Personality Disorder" OR DE "Paranoid Personality Disorder" OR DE "Passive Aggressive Personality Disorder" OR DE "Sadomasochistic Personality" OR DE "Schizoid Personality Disorder" OR DE "Schizotypal Personality Disorder")) OR (DE "Mental Disorders" OR DE "Affective Disorders" OR DE "Anxiety Disorders" OR DE "Bipolar Disorder" OR DE "Borderline States" OR DE "Chronic Mental Illness" OR DE "Dissociative Disorders" OR DE "Eating Disorders" OR DE "Gender Dysphoria" OR DE "Mental Disorders due to General Medical Conditions" OR DE "Neurocognitive Disorders" OR DE "Neurodevelopmental Disorders" OR DE "Neurosis" OR DE "Paraphilias" OR DE "Personality Disorders" OR DE "Psychosis" OR DE "Serious Mental Illness" OR DE "Sleep Wake Disorders" OR DE "Somatoform Disorders" OR DE "Stress and Trauma Related Disorders" OR DE "Substance Related and Addictive Disorders" OR DE "Thought Disturbances")) OR (DE "Obsessive Compulsive Disorder" OR DE "Hoarding Disorder" OR DE "Koro")) OR (DE "Panic Disorder")) OR (DE "Bipolar Disorder" OR DE "Bipolar I Disorder" OR DE "Bipolar II Disorder" OR DE "Cyclothymic Disorder" OR DE "Mania")) OR (DE "Suicide" OR DE "Attempted Suicide" OR DE "Suicidality")) OR (DE "Emotions" OR DE "Contempt" OR DE "Desire" OR DE "Emotional Content" OR DE "Emotional Disturbances" OR DE "Emotional Health" OR DE "Emotional Processing" OR DE "Emotional Regulation" OR DE "Emotional States" OR DE "Emotional Style" OR DE "Expressed Emotion" OR DE "Negative Emotions" OR DE "Positive Emotions")) OR (DE "Mental Confusion")

5	TI (((mental N1 health) or mood or depressed or depression or depressive or anxiety or anxieties or anxious or stress disorder or stress disorders or PTSD or post#trauma or post#traumatic or (substance N1 (abuse or addiction or dependence)) or (drug N1 (abuse or addiction or dependence)) or psychotic or psychoses or psychosis or schizoaffective or hallucinating or hallucination or hallucinations hallucinated or delusion or delusions or apathy or apathetic or indifference or agitated or agitation or agitations or euphoria or euphoric or elation or elated or disinhibition or disinhibitions or disinhibited or aggression or aggressions or personality or mental or affective or (obsessive N1 compulsive) or OCD or panic or neurosis or neurotic or bipolar or mania or manic or suicide or suicidality or suicidal or emotion or tired or confusion or confused)) OR AB (((mental N1 health) or mood or depressed or depression or depressive or anxiety or anxieties or anxious or stress disorder or stress disorders or PTSD or post#trauma or post#traumatic or (substance N1 (abuse or addiction or dependence)) or (drug N1 (abuse or addiction or dependence)) or psychotic or psychoses or psychosis or schizoaffective or hallucinating or hallucination or hallucinations hallucinated or delusion or delusions or apathy or apathetic or indifference or agitated or agitation or agitations or euphoria or euphoric or elation or elated or disinhibition or disinhibitions or disinhibited or aggression or aggressions or personality or mental or affective or (obsessive N1 compulsive) or OCD or panic or neurosis or neurotic or bipolar or mania or manic or suicide or suicidality or suicidal or emotion or tired or confusion or confused)) OR KW (((mental N1 health) or mood or depressed or depression or depressive or anxiety or anxieties or anxious or stress disorder or stress disorders or PTSD or post#trauma or post#traumatic or (substance N1 (abuse or addiction or dependence)) or (drug N1 (abuse or addiction or dependence)) or psychotic or psychoses or psychosis or schizoaffective or hallucinating or hallucination or hallucinations hallucinated or delusion or delusions or apathy or apathetic or indifference or agitated or agitation or agitations or euphoria or euphoric or elation or elated or disinhibition or disinhibitions or disinhibited or aggression or aggressions or personality or mental or affective or (obsessive N1 compulsive) or OCD or panic or neurosis or neurotic or bipolar or mania or manic or suicide or suicidality or suicidal or emotion or tired or confusion or confused))
6	S4 or S5
7	(DE "Hospitalization" OR DE "Commitment (Psychiatric)" OR DE "Hospital Admission" OR DE "Hospital Discharge" OR DE "Psychiatric Hospitalization" OR DE "Hospitalized Patients") OR (DE "Intensive Care" OR DE "Neonatal Intensive Care")
8	TI ((hospital or hospitalized or hospitalization or intensive or ICU or care or post#acute or inpatient or inpatients or admit or admitted or admitting)) OR AB ((hospital or hospitalized or hospitalization or intensive or ICU or care or post#acute or inpatient or inpatients or admit or admitted or admitting)) OR KW ((hospital or hospitalized or hospitalization or intensive or ICU or care or post#acute or inpatient or inpatients or admit or admitted or admitting))

9	S7 or S8
10	S3 and S6 and S9
11	limit 10 to english language
12	limit 11 to yr="2019-Current"

EBSCOhost CINAHL Plus with Full Text **Date Searched: 07-15-20; updated 10-08-20; updated 03-17-21**	
#	**Search Statement**
1	TI (((coronavir* OR corona virus* OR betacoronavir* OR covid19 OR covid 19 OR nCoV OR CoV 2 OR CoV2 OR sarscov2 OR 2019nCoV OR 2019 novel coronavirus* OR 2019 novel CoV OR wuhan virus*) OR ((wuhan OR hubei OR huanan) AND (severe acute respiratory OR pneumonia*)))) OR AB (((coronavir* OR corona virus* OR betacoronavir* OR covid19 OR covid 19 OR nCoV OR CoV 2 OR CoV2 OR sarscov2 OR 2019nCoV OR 2019 novel coronavirus* OR 2019 novel CoV OR wuhan virus*) OR ((wuhan OR hubei OR huanan) AND (severe acute respiratory OR pneumonia*)))) OR MW (((coronavir* OR corona virus* OR betacoronavir* OR covid19 OR covid 19 OR nCoV OR CoV 2 OR CoV2 OR sarscov2 OR 2019nCoV OR 2019 novel coronavirus* OR 2019 novel CoV OR wuhan virus*) OR ((wuhan OR hubei OR huanan) AND (severe acute respiratory OR pneumonia*))))
2	(MH "Coronavirus Infections+") OR (MH "Coronavirus+") OR (MH "COVID-19")
3	S1 or S2
4	(MH "Mental Health") OR (MH "Affective Disorders+") OR (MH "Depression+") OR (MH "Anxiety+") OR (MH "Anxiety Disorders+") OR (MH "Stress Disorders, Post-Traumatic+") OR (MH "Substance Use Disorders+") OR (MH "Psychotic Disorders+") OR (MH "Affective Disorders, Psychotic+") OR (MH "Hallucinations+") OR (MH "Delusions+") OR (MH "Apathy") OR (MH "Aggression+") OR (MH "Personality Disorders+") OR (MH "Schizophrenia+") OR (MH "Mental Disorders+") OR (MH "Obsessive-Compulsive Disorder+") OR (MH "Panic Disorder") OR (MH "Bipolar Disorder+") OR (MH "Emotions+") OR (MH "Confusion+")
5	TI (((mental N1 health) or mood or depressed or depression or depressive or anxiety or anxieties or anxious or stress disorder or stress disorders or PTSD or post?trauma or post?traumatic or (substance N1 (abuse or addiction or dependence)) or (drug N1 (abuse or addiction or dependence)) or psychotic or psychoses or psychosis or schizoaffective or hallucinating or hallucination or hallucinations hallucinated or delusion or delusions or

	apathy or apathetic or indifference or agitated or agitation or agitations or euphoria or euphoric or elation or elated or disinhibition or disinhibitions or disinhibited or aggression or aggressions or personality or mental or affective or (obsessive N1 compulsive) or OCD or panic or neurosis or neurotic or bipolar or mania or manic or suicide or suicidality or suicidal or emotion or tired or confusion or confused)) OR AB (((mental N1 health) or mood or depressed or depression or depressive or anxiety or anxieties or anxious or stress disorder or stress disorders or PTSD or post?trauma or post?traumatic or (substance N1 (abuse or addiction or dependence)) or (drug N1 (abuse or addiction or dependence)) or psychotic or psychoses or psychosis or schizoaffective or hallucinating or hallucination or hallucinations hallucinated or delusion or delusions or apathy or apathetic or indifference or agitated or agitation or agitations or euphoria or euphoric or elation or elated or disinhibition or disinhibitions or disinhibited or aggression or aggressions or personality or mental or affective or (obsessive N1 compulsive) or OCD or panic or neurosis or neurotic or bipolar or mania or manic or suicide or suicidality or suicidal or emotion or tired or confusion or confused)) OR MW (((mental N1 health) or mood or depressed or depression or depressive or anxiety or anxieties or anxious or stress disorder or stress disorders or PTSD or post?trauma or post?traumatic or (substance N1 (abuse or addiction or dependence)) or (drug N1 (abuse or addiction or dependence)) or psychotic or psychoses or psychosis or schizoaffective or hallucinating or hallucination or hallucinations hallucinated or delusion or delusions or apathy or apathetic or indifference or agitated or agitation or agitations or euphoria or euphoric or elation or elated or disinhibition or disinhibitions or disinhibited or aggression or aggressions or personality or mental or affective or (obsessive N1 compulsive) or OCD or panic or neurosis or neurotic or bipolar or mania or manic or suicide or suicidality or suicidal or emotion or tired or confusion or confused))
6	S4 or S5
7	(MH "Hospitalization+") OR (MH "Inpatients") OR (MH "Intensive Care Units+") OR (MH "Subacute Care")
8	(hospital or hospitalized or hospitalization or intensive or ICU or care or post-acute or post acute or inpatient or inpatients or admit or admitted or admitting)
9	S7 or S8
10	S3 and S6 and S9
11	limit S10 to english language
12	limit S11 to yr="2019-Current"

INCLUSION/EXCLUSION CRITERIA

	Include	Exclude	Code
Population	Include adults who have been hospitalized with confirmed or presumed COVID-19 diagnosis.	Exclude adults who have been hospitalized for SARs, MERs, or other respiratory diseases and adults with COVID-19 that have not been hospitalized. Also exclude adults staying at facilities where the primary purpose is to quarantine individuals who have COVID-19 or have been exposed to COVID-19.	E1
Intervention	NA	Exclude intervention studies that do not report relevant outcome data	E2
Comparator	Include • KQ1, 4 & 5- no comparator • KQ2, 3, & 4a- before vs after hospitalization • KQ2a, 3a & 4b- patients hospitalized for COVID-19 vs patients who received outpatient treatment for COVID-19 • KQ2b, 3b & 4c- patients hospitalized for COVID-19 vs patients hospitalized for other causes • KQ2c, 3c, & 4d- subgroups vs each other	NA	E3
Outcomes	Include prevalence or incidence of diagnosis or symptoms of mood disorders, anxiety disorders, trauma-related disorders, psychotic disorders, and substance use disorders, as well as health care utilization and self-reported mental health care resource needs	Exclude prevalence or incidence of diagnosis or symptoms of delirium, cognitive disorders, and post intensive care syndrome (PICS) except when mental health symptoms of PICS are reported separately	E4
Timing	Include during or after hospitalization	Exclude before hospitalization	E5
Setting	Include any setting	NA	E6
Study Design	Include retrospective/prospective cohort or cross-sectional	Exclude case series, case reports, and other study designs where sample is selected based on observed outcome	E7
Publication type	Include full-text studies	Exclude: Abstract only, protocol only, editorial, letter, narrative review.	E8
Outdated or ineligible SR	Include systematic reviews that meet our inclusion criteria	Exclude systematic reviews that include studies prior to 2019, that examine conditions other than COVID-19, *etc*	E9
Language	Include English	Exclude languages other than English	E10
Preprints	NA	Exclude pre-prints	E11

LIST OF EXCLUDED STUDIES

Exclude reasons: 1=Ineligible population, 2=Ineligible intervention, 3=Ineligible comparator, 4=Ineligible outcome, 5=Ineligible timing, 6= Ineligible setting, 7=Ineligible study design, 8=Ineligible publication type, 9=Outdated or ineligible systematic review, E10=language, E11=preprint

#	Citation	Exclude reason
1	Agarwal A, Agrawal S, Agarwal A. Mental health among patients in a COVID-19-dedicated facility. Transactions of the Royal Society of Tropical Medicine & Hygiene. 2021;115(1):1-2.	E8
2	Ahmed, H., et al. (2020). "Long-term clinical outcomes in survivors of severe acute respiratory syndrome and Middle East respiratory syndrome coronavirus outbreaks after hospitalisation or ICU admission: A systematic review and meta-analysis." Journal of Rehabilitation	E1
3	Ahc M. The Effects of COVID-19 on the Brain: Dual risk to HCWs of infections, stress of pandemic. Hospital Employee Health. 2020;39(8):1-2.	E8
4	André A, Félix C, Corvacho M, Nzwalo H. On the plausibility of late neuropsychiatric manifestations associated with the COVID-19 pandemic. J Neurol Sci. 2020;417:117060.	E8
5	Arango C, Wykes T, Moreno C. Mental health care and COVID-19. The Lancet Psychiatry. 2020;7(12):1013.	E8
6	Arbelo N, Lopez-Pelayo H, Sague M, et al. Psychiatric Clinical Profiles and Pharmacological Interactions in COVID-19 Inpatients Referred to a Consultation Liaison Psychiatry Unit: a Cross-Sectional Study. Psychiatric Quarterly. 2021;07:07.	E4
7	Aubry JM, Gasser J. Covid-19 et santé mentale. Rev Med Suisse. 2020;16(707):1731.	E11
8	Bo, H. X., et al. (2020). "Posttraumatic stress symptoms and attitude toward crisis mental health services among clinically stable patients with COVID-19 in China." Psychological Medicine: 1-2.	E1
9	Boshra SN, Islam MM, Griffiths MD. The demography and apparent risk factors of COVID-19-related suicides in Bangladesh in a seven-month period of the pandemic. medRxiv. 2020.	E7
10	Butler M, Bano F, Calcia M, et al. Clozapine prescribing in COVID-19 positive medical inpatients: a case series. Ther Adv Psychopharmacol. 2020;10:2045125320959560.	E7
11	Canady VA. Study finds COVID-19 survivors exhibit MH signs one month after treatment. Mental Health Weekly. 2020.	E8
12	Canady VA. British study: PTSD symptoms present in COVID-19 survivors. Mental Health Weekly. 2021;31(9):5-6.	E8
13	Canady VA. Study finds COVID-19 survivors exhibit MH signs one month after treatment. Mental Health Weekly. 2020;30(32):1-3.	E8
14	Cao di San Marco E, Menichetti J, Vegni E. COVID-19 emergency in the hospital: How the clinical psychology unit is responding. Psychol Trauma. 2020;12(S1):S43-s44.	E8
15	Castro, V. M. and R. H. Perlis (2020). "Electronic Health Record Documentation of Psychiatric Assessments in Massachusetts Emergency Department and Outpatient Settings During the Coronavirus Disease 2019 (COVID-19) Pandemic."	E1

#	Citation	Exclude reason
	JAMA Network Open 3(6): e2011346.	
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LIMITED DATA ABSTRACTION TABLE OF STUDIES WITH < 200 PARTICIPANTS

Reference	Study design	Sample size	Country	Population	Outcomes measured	Timing
Akinci T, Melek Basar H. Relationship between sleep quality and the psychological status of patients hospitalised with COVID-19. Sleep Medicine. 2021;80:167-170.	Cross-sectional	189	Turkey	Patients who were hospitalized with COVID-19 in April and May of 2020	• Depression symptoms • Anxiety symptoms • Sleep quality	First 3 days of hospitalization
Cai X, Hu X, Ekumi IO, et al. Psychological Distress and Its Correlates Among COVID-19 Survivors During Early Convalescence Across Age Groups. American Journal of Geriatric Psychiatry. 2020;28(10):1030-1039.	Cross-sectional	126	China	Discharged COVID-19 survivors transferred to isolation hospital for 14-day quarantine	• PTSD symptoms • Anxiety symptoms • Depression symptoms	During 14-day quarantine after hospital admission
Chang MC, Park D. Incidence of Post-Traumatic Stress Disorder After Coronavirus Disease. Healthcare. 2020;8(4):30.	Cross-sectional	64	Korea	Discharged COVID-19 survivors	• PTSD symptoms	After discharge (mean 75.7 days)
De Lorenzo R, Conte C, Lanzani C, et al. Residual clinical damage after COVID-19: A retrospective and prospective observational cohort study. PLoS One. 2020;15(10):e0239570-e0239570.	Retrospective cohort	185	Italy	Admitted patients with confirmed SARS-CoV-2 infection	• Psychiatric symptoms (anxiety, insomnia, PTSD)	Median 23 days after hospital discharge

Reference	Study design	Sample size	Country	Population	Outcomes measured	Timing
Dorman-Ilan S, Hertz-Palmor N, Brand-Gothelf A, et al. Anxiety and Depression Symptoms in COVID-19 Isolated Patients and in Their Relatives. Frontiers in psychiatry Frontiers Research Foundation. 2020;11:581598.	Cross-sectional	90	Israel	Isolated patients hospitalized for COVID-19	• Depression symptoms • Anxiety symptoms	25–72 h following admission
Fang C, Xiao-Dong W, Kan-Kai Z, et al. Investigation of the psychological status of suspected patients during the Coronavirus disease 2019 epidemic. Medicine. 2020;99(38):1-6.	Cross-sectional	31	China	Hospitalized patients suspected to have COVID-19	• Depression symptoms • Anxiety symptoms • Overall mental health	During hospitalization
Hao F, Tam W, Hu X, et al. A quantitative and qualitative study on the neuropsychiatric sequelae of acutely ill COVID-19 inpatients in isolation facilities. Transl Psychiatry Psychiatry. 2020;10(1):355.	Cross-sectional	30	China	Acutely ill patients with COVID-19 who received treatment in hospital isolation wards	• Psychological impact of COVID-19 (Measured with Impact of Event Scale-Revised (IES-R) • Depression, anxiety, and stress symptoms (DASS-21) • Insomnia symptoms (ISI) • Other psychological symptoms	During hospitalization
Horn M, Wathelet M, Fovet T, et al. Is COVID-19 Associated With Posttraumatic Stress Disorder? Journal of Clinical Psychiatry.	Prospective cohort	180	France	Patients with lab confirmed COVID-19	• PTSD symptoms	7 weeks after onset of COVID-19 symptoms

Reference	Study design	Sample size	Country	Population	Outcomes measured	Timing
2020;82(1):08.						
Hu Y, Chen Y, Zheng Y, et al. Factors related to mental health of inpatients with COVID-19 in Wuhan, China. Brain, Behavior, & Immunity. 2020;15:15.	Cross-sectional	85	China	Inpatients who were definitively diagnosed with COVID-19 treated in 2 isolation wards of a hospital for adult patients with severe COVID-19	• Depression symptoms • Anxiety symptoms • Insomnia symptoms • Depression symptoms	During hospitalization
Kandeger A, Aydin M, Altinbas K, et al. Evaluation of the relationship between perceived social support, coping strategies, anxiety, and depression symptoms among hospitalized COVID-19 patients. International Journal of Psychiatry in Medicine. 2020:91217420982085.	Cross-sectional	84	Turkey	Hospitalized COVID-19 patients	• Depression symptoms • Anxiety symptoms	During hospitalization
Kim JW, Stewart R, Kang SJ, Jung SI, Kim SW, Kim JM. Telephone based Interventions for Psychological Problems in Hospital Isolated Patients with COVID-19. Clinical Psychopharmacology & Neuroscience. 2020;18(4):616-620.	Single-arm longitudinal	33	Korea	Hospitalized COVID-19 patients	• Anxiety symptoms • Depression symptoms • Insomnia symptoms • Suicidal ideation	Baseline, 1 week, and 2 weeks

Reference	Study design	Sample size	Country	Population	Outcomes measured	Timing
Kong X, Kong F, Zheng K, et al. Effect of Psychological-Behavioral Intervention on the Depression and Anxiety of COVID-19 Patients. Frontiers in psychiatry Frontiers Research Foundation. 2020;11:586355	Cross-sectional + RCT	144	China	Hospitalized COVID-19 patients	• Depression symptoms • Anxiety symptoms	During hospitalization
Li X, Tian J, Xu Q. The Associated Factors of Anxiety and Depressive Symptoms in COVID-19 Patients Hospitalized in Wuhan, China. Psychiatric Quarterly. 2020;23:23.	Cross-sectional	99	China	Hospitalized COVID-19 patients	• Anxiety symptoms • Depression symptoms	During hospitalization
Matalon N, Dorman-Ilan S, Hasson-Ohayon I, et al. Trajectories of post-traumatic stress symptoms, anxiety, and depression in hospitalized COVID-19 patients: A one-month follow-up. Journal of Psychosomatic Research. 2021;143:110399.	Prospective cohort	64	Israel	Hospitalized COVID-19 patients	• PTSD symptoms • Depressive symptoms • Anxiety symptoms	Within a few days of admission, at 2 weeks following hospital admission, and at 1 month after admission
Mendez R, Balanza-Martinez V, Luperdi SC, et al. Short-term neuropsychiatric outcomes and quality of life in COVID-19 survivors. Journal of Internal Medicine. 2021;03:03.	Cross-sectional	179	Spain	Hospitalized COVID-19 survivors	• Symptoms of anxiety, depression, and PTSD	2 months after discharge
Nie X-D, Wang Q, Wang M-N, et al. Anxiety and depression and its correlates in patients with	Cross-sectional	78	China	Patients diagnosed with COVID-19 admitted to inpatient	• Anxiety symptoms	During hospitalization

Reference	Study design	Sample size	Country	Population	Outcomes measured	Timing
coronavirus disease 2019 in Wuhan. International Journal of Psychiatry in Clinical Practice. 2020:1-6.				wards	• Depression symptoms	
Park SY, Kim B, Jung DS, et al. Psychological distress among infectious disease physicians during the response to the COVID-19 outbreak in the Republic of Korea. BMC Public Health. 2020;20(1):1811.	Cross-sectional	10	Korea	Discharged patients after recovery from COVID-19 pneumonia	• Depression symptoms • Anxiety symptoms • PSTD symptoms	1 month post-discharge
Parker C, Shalev D, Hsu I, et al. Depression, Anxiety, and Acute Stress Disorder Among Patients Hospitalized With Coronavirus Disease 2019: A Prospective Cohort Study. Psychosomatics. 2020;10:10.	Prospective cohort	58	United States	Patients admitted to non-intensive care unit medical ward settings with COVID-19	• Anxiety symptoms • Depression symptoms	At admission and 2 weeks following admission
Putri DU, Tsai YS, Chen JH, et al. Psychological distress assessment among patients with suspected and confirmed COVID-19: A cohort study. Journal of the Formosan Medical Association. 2021;26:26.	Prospective cohort	109	Taiwan	Adult patients with suspected or confirmed COVID-19 admitted to hospital	• Psychological symptoms (Anxiety, depression, hostility, interpersonal sensitivity, and insomnia) • Suicidal ideation	At hospital admission, discharge, and during outpatient follow-up (7 days post-discharge)
Raman B, Cassar MP, Tunnicliffe EM, et al. Medium-term effects of SARS-CoV-2 infection on multiple vital organs, exercise capacity, cognition, quality of life and mental	Prospective cohort	58	UK	Survivors of moderate to severe COVID-19 who were admitted to a hospital	• Depression symptoms • Anxiety symptoms	2-3 months from disease onset

Reference	Study design	Sample size	Country	Population	Outcomes measured	Timing
health, post-hospital discharge. EClinicalMedicine. 2021;31:100683.						
Rass V, Beer R, Josef Schiefecker A, et al. Neurological outcome and quality of life three months after COVID-19: a prospective observational cohort study. European Journal of Neurology. 2021;07:07.	Prospective cohort	135	Austria	COVID-19 patients	• Anxiety symptoms • Depression symptoms • PTSD symptoms	3 months after disease onset
Suarez-Robles M, Iguaran-Bermudez MDR, Garcia-Klepizg JL, Lorenzo-Villalba N, Mendez-Bailon M. Ninety days post-hospitalization evaluation of residual COVID-19 symptoms through a phone call check list. The Pan African medical journal. 2020;37:289.	Cross-sectional	134	Spain	Discharged COVID-19 patients	Anxiety symptoms	90 days after hospital discharge
Sykes DL, Holdsworth L, Jawad N, Gunasekera P, Morice AH, Crooks MG. Post-COVID-19 Symptom Burden: What is Long-COVID and How Should We Manage It? Lung. 2021;11:11.	Prospective cohort	134	England	All patients with COVID-19 pneumonia discharged from a large teaching hospital	• Anxiety symptoms • Low mood symptoms • Sleep disturbances	Median of 113 days (range = 46-167) post-discharge
Tomasoni D, Bai F, Castoldi R, et al. Anxiety and depression symptoms after virological clearance of COVID-19: A cross-sectional study in Milan, Italy.	Cross-sectional	105	Italy	Hospitalized COVID-19 patients with documented clinical recovery and virological	• Anxiety symptoms • Depression symptoms	1-3 months after discharge

Reference	Study design	Sample size	Country	Population	Outcomes measured	Timing
Journal of Medical Virology. 2020;25:25.				clearance		
van den Borst B, Peters JB, Brink M, et al. Comprehensive health assessment three months after recovery from acute COVID-19. Clinical Infectious Diseases. 2020;21:21.	Prospective cohort	124	Netherlands	Patients discharged after COVID-19 hospitalization	• Anxiety symptoms • Depression symptoms • PTSD symptoms	3 months after recovery
van der Sar-van der Brugge S, Talman S, Boonman-de Winter L, et al. Pulmonary function and health-related quality of life after COVID-19 pneumonia. Respiratory Medicine. 2021;176:106272.	Prospective cohort	101	Netherlands	Patients discharged from hospital after PCR-proven, non-critical COVID-19 pneumonia	• Depression symptoms • Anxiety symptoms	6 weeks post-discharge
Xu F, Wang X, Yang Y, et al. Depression and insomnia in COVID-19 survivors: a cross-sectional survey from Chinese rehabilitation centers in Anhui province. Sleep Medicine. 2021;08:08.	Cross-sectional	125	China	Patients discharged after COVID-19 hospitalization	• Depression symptoms • Insomnia symptoms	2 weeks after discharge
Yuan B, Li W, Liu H, et al. Correlation between immune response and self-reported depression during convalescence from COVID-19. Brain, Behavior, & Immunity. 2020;25:25.	Cross-sectional	96	China	Hospitalized COVID-19 patients who were discharged to forced-quarantine at a separate hospital for 2 weeks	• Depression symptoms •	Up to 2 weeks after hospitalization

Reference	Study design	Sample size	Country	Population	Outcomes measured	Timing
Zandifar A, Badrfam R, Yazdani S, et al. Prevalence and severity of depression, anxiety, stress and perceived stress in hospitalized patients with COVID-19. Journal of Diabetes & Metabolic Disorders. 2020:1-8.	Cross-sectional	106	Iran	Hospitalized COVID-19 patients from isolated treatment wards	• Depression symptoms • Anxiety symptoms	During hospitalization
Zarghami A, Farjam M, Fakhraei B, Hashemzadeh K, Yazdanpanah MH. A Report of the Telepsychiatric Evaluation of SARS-CoV-2 Patients. *Telemedicine Journal & E Health.* 2020;11:11	Cross-sectional	82	Iran	All severe COVID-19 patients in 1 city	• Depression symptoms • Anxiety symptoms • Diagnosis of Major Depressive Disorder • Diagnosis of Generalized Anxiety Disorder • Diagnosis of insomnia • Diagnosis of Adjustment Disorder	During hospitalization
Zhang J, Xu D, Xie B, et al. Poor-sleep is associated with slow recovery from lymphopenia and an increased need for ICU care in hospitalized patients with COVID-19: A retrospective cohort study. Brain, Behavior, & Immunity. 2020;88:50-58.	Retrospective cohort	135	China	Patients hospitalized with COVID-19 for 14+ days	• Quality of sleep • Insomnia	Within 30 days of hospital admission

EVIDENCE TABLES

DATA ABSTRACTION OF INCLUDED STUDIES WITH ≥ 200 PARTICIPANTS

Author Year Study design Sample Size Country	Population	How diagnosed with COVID-19	Timing & When Outcomes Measured	Comparator (if applicable)	Outcomes
Atalla 2020[1] Retrospective chart review N=339 United States	Hospitalized COVID-19 patients who were re-admitted vs not readmitted -Age (median): 61 -Sex (Female): 43.7% -Race (Total): 37.2% Hispanic, 1.2% Asian, 16.2% African American, 42.8% Caucasian, 2.7% other -Comorbidities (Total): Congestive heart failure (9.4%), Cardiac arrhythmias (18.9%), Hypertension (45.4%), Diabetes (33.3%), Obesity (39.8%), Chronic pulmonary disease (15.3%), Renal failure (10.6%), Liver disease (3.2%), Cancer (8%), Alcohol abuse (5.3%), Drug abuse (5%), Mental illness (17.1%)	Reverse transcriptase polymerase chain reaction (RT-PCR).	Mar 1 - Apr 19 2020 Outcomes extracted from medical records, presumably during hospitalization	Readmitted (n=19) vs non-readmitted (n=320) COVID-19 patients	**KQ4:** 3/19 readmitted patients had a psychiatric episode as the reason for readmission. 2/3 of these patients either had bipolar disorder or suicidal ideation noted at initial admission (1 patient with bipolar disorder and other comorbidities was admitted for a fall then re-admitted for AMS and aggressive agitation; the other patient with suicidal ideation at admission was re-admitted for suicidal ideation, depression, and acute gastroenteritis). The third patient did not have a mental health disorder noted at initial admission (reason for initial admission = hip pain, chest pain; reason for re-admission = brief psychotic episode). **KQ5:** Authors note these 3 patients needed psychiatric evaluation.
Chamberlain 2021[2] Cross-sectional N=13,049 UK	People with a self-reported diagnosed history of COVID-19 infection, including those who reported they had received a positive confirmation via a biological test. Age: median 44 yrs Sex: 54.1% female, 0.5% other	Self-report of diagnosis and/or positive test	May-20 After recovery	COVID-19 pts without hospitalization + no respiratory symptoms	**KQ2:** Relative to COVID-19 survivors without respiratory symptoms, patients who required hospitalization experienced more PTSD symptoms (hospitalized, no ventilator: effect size 0.234 p=0.0058; hospitalized with ventilator: effect size 0.454, p=0.001)

Author Year Study design Sample Size Country	Population	How diagnosed with COVID-19	Timing & When Outcomes Measured	Comparator (if applicable)	Outcomes
	Ethnicity: 0.1% Rom, Sinti, or Bedouin; 0.2% North African; 0.4% Sub-Saharan African or Afro-American; 0.4% West-central Asian; 0.6% American Hispanic; 1.2% East Asian; 1.3% unknown ethnicity; 3.1% Indian, South Asian, or Southeast Asian; 3.2% mixed ethnicity; 89.5% White European or North American Comorbidities: NR				
Chen 2021[3] Cross-sectional N= 898 China	Hospitalized pts with COVID-19 (recruited primarily from Wuhan) Age: mean 39.40 yrs (SD=14.05) Sex: 57.5% female Race: NR Comorbidities: NR	NR	Mar 22 - May 24, 2020 During hospitalization	Subgroups to each other	**KQ1:** Prevalence of MH disorders: PTSD: 13.2% (PCL-5 cut-off score of 33) Depression: 21.0% (PHQ-9 cut-off score 10; 11.5% moderate, 6.3% severe, and 3.2% very severe) Anxiety: 16.4% (GAD-7 cut-off score 10; 10.9% moderate and 5.5% severe) **KQ2:** No MH outcomes were significantly associated with sex or age in multivariable logistic regression.
Einvik 2021[4] Cross-sectional N=583 (125 hospitalized) Norway	Hospitalized COVID-19 patients discharged before June 1, 2020 Age (mean): 57.7 (Hospitalized group) vs 49.6 (non-hospitalized group) Sex: 42% female (Hospitalized group) vs 56% female (non-hospitalized group) Race: 63% (hospitalized group) vs 84% (non-hospitalized group) born in Norway Comorbidities:	Positive polymerase chain reaction	June-September 2020 3 months after discharge	Hospitalized vs non-hospitalized patients	**KQ1:** PTSD (measured using PCL-5): PTSD was present in 9.5% of hospitalized and 7.0% of non-hospitalized individuals. In regression, no association between being hospitalized and symptom-defined PTSD. Age, sex, time from COVID-19 onset not associated with PTSD. Being born outside of Norway was associated with PTSD.

Author Year Study design Sample Size Country	Population	How diagnosed with COVID-19	Timing & When Outcomes Measured	Comparator (if applicable)	Outcomes
	Hospitalized group; Asthma (20%), COPD (3%), other chronic lung (0%), lymphoma (0%), cancer (3%), gastrointestinal (4%), heart problems (10%), hypertension (28%), circulatory (1%), chronic kidney disease (2%), neuromuscular (5%), stroke (3%), Rheumatic (1%), venous thromboembolism (4%), diabetes (12%), depression: NA; Hospitalized group: 42% had 0 comorbidities, 34% had 1 comorbidity, 25% had 2+ comorbidities				
Islam 2021[5] Cross-sectional N=1002 (208 hospitalized) Bangladesh	Individuals who recovered from COVID-19 (selected through snowballing techniques): Age: mean 34.7 Sex: 42.1% female Race: NR Comorbidities: 52.5% sleep disturbance, 12.3% smoking, 21.2% diabetes, 24.9% hypertension, 8.2% heart disease, 2.4% cancer, 5.9% kidney problems, 25.4% asthma/respiratory problems	Self-report of positive test	Sep 11 - Oct 13 2020 After COVID-19 recovery	Hospitalized vs non-hospitalized pts with COVID-19	**KQ1:** 62.5% of participants who reported being hospitalized for COVID-19 screened positive for depression (PHQ-9). **KQ2:** 62.5% of participants who reported being hospitalized for COVID-19 screened positive for depression (PHQ-9), compared to 44.3% of those without hospitalization (p<0.001)
Jiang 2020[6] Cross-sectional	Hospitalized COVID-19 patients Age: 29.2% (≤41), 32.7% (42-51), 38.1% (≥52) Sex: 47% female Race: NR	Chest CT scanning or RT-PCR	Feb 17 and Mar 14 2020 During hospitalization	NA	**KQ2:** Prevalence/incidence of MH disorders not reported. Females had higher SAS and SDS scores than males, but there were no differences in PSQI scores. Age was associated with SDS and PSQI scores. Those with moderate or severe symptoms

Author Year Study design Sample Size Country	Population	How diagnosed with COVID-19	Timing & When Outcomes Measured	Comparator (if applicable)	Outcomes
N=202 China	Comorbidities: 43.1% had history of chronic disease				had higher scores on PSQI than those with mild symptoms. There were no differences in SAS, SDS, or PSQI based on hospital duration.
Li 2020[7] Cross-sectional N=280 China	Hospitalized COVID-19 patients in stable condition Age: <35 (9.3%), 36-50 (26.4%), 51-65 (37.1%), >66 (27.1%) Sex (% female): 48.2% Comorbidities: hypertension (30.7%), diabetes (11.1%), and chronic heart diseases, chronic liver disease (4.6%), chronic lung disease (3.9%), cerebrovascular disease (2.5%), gastric ulcer (2.1%), tumor (1.8%), anemia (1.8%), chronic kidney disease (1.1%), hyperthyroidism (1.1%), hypothyroidism (0.7%), and gout (0.7%). Pts with mental illness were excluded.	Diagnosis and Treatment Protocol for Novel Coronavirus Pneumonia (Trial Version 6	Feb 29 - Mar 2 2020 Outcomes measured during hospitalization	NA	**KQ1:** Psychological dysfunction of COVID-19 patients as a result of the disease: Sleep disorders (63.6%), anxiety (62.1%), fear (50.0%), apathy (41.8%), depression (40.7%), despair (32.5%). **KQ5:** 59% reported at least some need for psychological guidance in rehabilitation.
Liu 2020[8] Cross-sectional N=675 China	Recovered COVID patients who had been discharged from hospitals Age: 53.6 Sex (% female): 53% Race: NR Comorbidities: Underlying illness (37.2%)	NR	Apr 11-22, 2020 Outcomes measured during post-discharge period (average 36.75 days)	Subgroups vs each other	**KQ1:** About 84 (12.4%) were provisionally diagnosed with clinically significant symptoms of PTSD due to COVID-19. The median score of PCL-5 was 12 (ICQ [4,16]). For anxiety, 70 (10.4%) were categorized as having moderate to severe symptoms, with another 218 (32.3%) reporting mild symptoms. 128 (19%) were categorized as having moderate to severe depression symptoms, with another 315 (46.7%) reporting mild symptoms. The median scores of GAD-7 and PHQ-9 were respectively 4 and 5 . There was significant overlap in symptoms; 41 (6.07%) had severe anxiety and clinically significant

Author Year Study design Sample Size Country	Population	How diagnosed with COVID-19	Timing & When Outcomes Measured	Comparator (if applicable)	Outcomes
					PTSD, 57 (8.44%) had clinically significant PTSD and depression, another 57 (8.44%) had both depression and anxiety symptoms, and 37 (5.48%) were categorized with all three. KQ2: Treatment by invasive mechanical ventilation and testing positive for COVID-19 RNA after discharge were not significant predictors of any of the 3 mental illness indicators (p>.05). Treatment with corticosteroid was associated with lower risk of PTSD due to COVID-19 (p=.016) but higher risk of anxiety (p=.022). ICU was associated with higher level of depression (p = 0.003). Disease severity consistently acted as a main risk factor for PTSD due to COVID-19 (p<.001), severe depression (p<.001) and severe anxiety (p<.001). Thus, the more severe the disease was, the worse the mental illness outcomes. Odds of reporting moderate to severe anxiety were significant increased by higher disease severity (OR, 2.91, 95% CI, [1.55,5.48]) and living with children (OR, 8.01, 95% CI, [2.79,23.04]). Odds of reporting severe depression significantly increased by each of the following: higher educational level (OR, 1.54, 95% CI, [1.07, 2.22]), living with children (OR, 4.75, 95% CI, [2.20, 10.23]), smoking (OR, 4.89, 95% CI, [2.05, 11.66]), higher disease severity (OR, 4.40, 95% CI, [2.51, 7.74])
Ma 2020[9]	COVID-19 patients across 5 designated isolation hospitals for	Diagnosis and Treatment	Feb 24 - Mar 8, 2020	NA	**KQ1:** Of the 93 patients with severe COVID-19 infection. 48 (14.5% of total pop) had symptoms of

Author Year Study design Sample Size Country	Population	How diagnosed with COVID-19	Timing & When Outcomes Measured	Comparator (if applicable)	Outcomes
Cross-sectional survey N=770 (93 with severe COVID-19 infection) China	COVID-19 (before discharge) Age: 50.4 Sex (% female): 52% Race: NR Comorbidities: NR	Protocol for Novel Coronavirus Pneumonia	Outcomes measured during hospitalization		depression and 45 (10.3% of total pop) did not (defined as score ≥ 5 on PHQ-9)
Mandal 2020[10] Cross-sectional N=384 England	Discharged COVID-19 patients Age: mean 59.9 Sex (M:F): 62:38 Race: British Caucasian 38.8%,Other Caucasian 17.1%, British Asian 6.5%, Other Asian 10.3%, Black British 6.8%, Other black 7.6%, Other ethnicity 13.9% Comorbidities: Hypertension: 41.9%, Diabetes Mellitus 27.2%, Asthma and/or COPD: 17.5%, Chronic Kidney Disease: 11%, Ischaemic heart disease: 9.7%	Nasopharyngeal swab	NR 4-6 weeks after hospital discharge	NA	**KQ1:** 14.6% of participants had a PHQ-2 score of greater than 3 indicating significant depression.
Mario Gennaro 2021[11] Prospective cohort N=226 Italy	Discharged COVID-19 patients Age: mean 58.8 Sex: 34.1% female Race: NR Comorbidities: 27% had previous psychiatric history	Real-time reverse-transcriptase polymerase chain reaction (RT-PCR)	NR 3 months after discharge	Initial cohort (n=402) evaluated at one-month follow-up	**KQ1:** ZDS ≥50: 28% BDI-13 ≥8: 9% IES-R ≥33: 22% PCL-5 ≥33: 13% STAI-Y state ≥40: 30% OCI ≥21: 26% WHIIRS ≥9: 24% From the 1 month - 3 month follow-up, patients showed a significant decrease over time of PTSD symptoms (IES-R: F = 21.29, p = 0.001; PCL-5: F =

Author Year Study design Sample Size Country	Population	How diagnosed with COVID-19	Timing & When Outcomes Measured	Comparator (if applicable)	Outcomes
					9.07, p = 0.003), anxiety (STAI-state: F = 11.28, p = 0.001), and insomnia (WHIIRS: F = 9.36, p = 0.003). Depression (according to ZSDS and BDI) did not significantly change; and obsessive–compulsive symptomatology significantly worsened (F = 4.84,p = 0.030). 24.3% of all ppts showed DSM-5 criteria for the diagnosis of a current major psychiatric disorder. **KQ2:** Pts without MH history: ZDS ≥50: 23% BDI-13 ≥8: 5% IES-R ≥33: 15% PCL-5 ≥33: 6% STAI-Y state≥40: 21% OCI ≥21: 18% WHIIRS ≥9: 22% All ppts, majority of whom did not have psychiatric disorder: Females, patients with a positive previous psychiatric diagnosis, and patients who already presented psychopathological symptoms one month after discharge suffered more in all psychopathological domains. Duration of hospitalization associated with lower ZSDS, BDI-13, IES-R, PCL-5, and WHIIRS. Age and care setting not associated with self-rated psychopathology. **KQ3:** Pts with MH history: ZDS ≥ 50: 40% BDI-13 ≥8: 26% IES-R ≥33: 36% PCL-5 ≥33: 27% STAI-Y state ≥40: 50% OCI ≥21: 39% WHIIRS ≥9: 33%

Author Year Study design Sample Size Country	Population	How diagnosed with COVID-19	Timing & When Outcomes Measured	Comparator (if applicable)	Outcomes
					KQ4: 9% of patients with no previous psychiatric history and 32% of patients with positive previous psychiatric history were prescribed psychotropic drugs (selective serotonin reuptake inhibitors alone, or combined with sleep-inducing benzodiazepines).
Mazza 2020[12] Cross-sectional N=402 Italy	COVID-19 survivors enrolled in an ongoing prospective cohort study at a hospital in Italy. Age: 57.8 Sex (% female): 34.3% Race: NR Comorbidities: 26.4% had history of psychiatric illness	Not specified	Apr 6 - June 9, 2020 Outcomes measured mean 31 days after discharge	Hospitalized vs outpatients with COVID-19	**KQ1:** Proportion of hospitalized pts scoring at or above thresholds for clinical relevance on: PCL-5: 40/260 (15.4%) ZSDS: 79/273 (28.9%) BDI-13: 28/279 (10.0%) STAI-state: 99/254 (39.0%) STAI-trait: 83/257 (32.3%) WHIIRS: 108/273 (39.6%) OCI: 52/265 (19.6%) **KQ2:** In a multivariate analysis of the effects of sex, previous diagnosis of psychiatric illness, and hospitalization on current psychiatric status, hospitalization status did not have an independent effect (Wilks' lambda=0.98; F=0.84; d.f. [degrees of freedom] 8,266; p=0.570). The unadjusted prevalence of anxiety (assessed through STAI) was lower among hospitalized patients compared to non-hospitalized patients (STAI-state: 39.0% vs 51.7%, p= 0.037; STAI-trait: 32.2% vs 44.2%, p=0.038). The unadjusted prevalence of PTSD, depression, insomnia, and obsessive compulsive disorders (assessed through screening tools) were similar between hospitalized and non-hospitalized groups: PTSD (PCL-5); 15.4% (hospitalized vs 14.8 non-

Author Year Study design Sample Size Country	Population	How diagnosed with COVID-19	Timing & When Outcomes Measured	Comparator (if applicable)	Outcomes
					hospitalized); p=0.901 Depression (ZSDS): 28.9% (hospitalized) vs 35.8% (non-hospitalized); p=0.212. Depression (BDI-13): 10.0 (hospitalized) vs 15.1% (non-hospitalized); p=0.185. Insomnia (WHIIRS): 39.6% (Hospitalized)
Moayed 2021[13] Cross-sectional N=221 Iran	Hospitalized COVID-19 positive patients Age: mean 45.90 Sex: 7.69% female Race: NR Comorbidities: Cardiovascular (7.24%), diabetic (9.33%), hypertension (7.24%), allergy (5.44%), chronic kidney (3.33%), chronic liver (2.26%)	NR	Feb and Mar 2020 During hospitalization	NA	**KQ1:** Depression: 7% moderate, 38% severe, 54% extremely severe Anxiety: 2% severe, 97% extremely severe Depression & anxiety measured using The Depression Anxiety Stress Scale (DASS).
Moradian 2020[13] Cross-sectional N=200 Iran	Patients hospitalized for COVID-19 Age: mean 55.58 Sex: 20% female Race: NR Comorbidities: Renal diseases; 1.5%, Diabetes mellitus; 22.5%, Malignancy; 3.5%, Respiratory disease; 14.5%, Heart disease; 16%, Hypertension; 24%.	Real-time reverse transcriptase PCR of nasal and pharyngeal swab	Feb - Apr 2020 6 weeks after discharge	NA	**KQ1:** Anxiety: 35% (at admission) vs 15 (%) post-discharge
Sahan 2021[14] Cross-sectional N=281 Turkey	Patients with confirmed COVID-19 Age: mean 55 Sex: 49.1% female Race: NR Comorbidities: Hypertension; 34.5%, Diabetes; 12.9%, Coronary heart disease; 12.2%, COPD and asthma; 13.6%,	Turkish Ministry of Health guideline	Mar 24, 2020 - May 24, 2020 During hospitalization	NA	**KQ1:** Ninety-eight (34.9%) patients had significant levels of anxiety (HADS-A ≥10) and 118 (42.0%) had significant levels of depression (HADS-D ≥7. **KQ2**: Among all ppts (the majority of whom did not have psychiatric disorder), the following characteristics were associated with symptoms of anxiety: • Female gender

Author Year Study design Sample Size Country	Population	How diagnosed with COVID-19	Timing & When Outcomes Measured	Comparator (if applicable)	Outcomes
	Cancer; 8.6%, Psychiatric comorbidity; 23.8% (major depressive disorder n=28, panic disorder n=10, generalized anxiety disorder n=7, primary insomnia n=4, functional neurologic disorder n=3, bipolar disorder n=2, specific phobias n=2, fibromyalgia n=2, persistent complex bereavement disorder n=3, personality disorders = 2).				• Staying alone in the hospital room • Being on the first days in the hospital • Lifetime history of psychiatric disorder Among all ppts (the majority of whom did not have psychiatric disorder), the following characteristics were associated with symptoms of depression: • Being over 50 years of age • Staying alone in the hospital room • NSAID use before the week of hospital admission
Taquet 2020[15] Retrospective cohort N=62,354 US	Patients with record of COVID-19 diagnosis in TriNetX Analytics Network (network that captures anonymized healthcare data): Age: mean 49.3 Sex: 55.4% female, 45.1% male, 0.4% other Race: 51.0% White, 23.6% Black, 2.5% Asian, 0.5% American Indian or Alaska Native, 0.2% Native Hawaiian of Other Pacific Islander, 22.3% unknown Comorbidities: 25.6% previously diagnosed psychiatric illness (2.0% Psychotic Disorder, 15.9% Mood Disorder, 19.5% Anxiety Disorder)	ICD-10 codes in health record (COVID-19 (U07.1 and U07.2); pneumonia due to SARS-associated coronavirus (J12.81); other coronavirus as the cause of disease classified elsewhere (B97.29); or coronavirus infection unspecified (B34.2))	Jan 20 - Aug 1, 2020 Outcomes measured 14-90 days after COVID-19 diagnosis	Hospitalized vs outpatient patients with COVID-19	**KQ2:** Analysis restricted to patients without prior diagnosis of MH illness Hospitalized patients were at higher risk of psychiatric diagnosis than patients that were not admitted to hospital (HR 1.40, 95% CI: 1.06-1.85; p=0.019).
Taquet 2021[16] Retrospective cohort	Patients with confirmed COVID-19 diagnosis in TriNetX Analytics Network (network that captures anonymized healthcare data):	Confirmed diagnosis of COVID-19 (ICD-10 code U07.1)	Jan 20 – Dec 13 2020	a) Hospitalized vs outpatient patients with	**KQ1:** Incidence (95% CI) of MH disorder within 180 days of COVID-19 diagnosis: Composite (mood, anxiety, and/or psychotic disorder): 24.50% (23.76–25.26%) any diagnosis;

Author Year Study design Sample Size Country	Population	How diagnosed with COVID-19	Timing & When Outcomes Measured	Comparator (if applicable)	Outcomes
N=236,379 (46,302 hospitalized) International (Primarily US)	Age: mean 46 Sex: 55.6% female, 44% male, 0.4% other Race: 57.2% White, 18.8% Black, 20.3% unknown Comorbidities: 18.1% overweight or obesity, 30% hypertensive disease, 15.5% type 2 diabetes, 10.6% asthma, 7.2% nicotine dependence, 10.5% substance use disorder, 8.9% ischaemic heart disease, 18% other forms of heart disease, 6.7% chronic kidney disease, 19.1% neoplasms			COVID-19 b) Hospitalized in Intensive Treatment Unit vs hospitalized in non-ITU ward	8.85% (8.22–9.52) first diagnosis Mood disorder: 14.69% (14.09–15.32) any diagnosis; 4.49% (4.05–4.99) first diagnosis Anxiety disorder: 16.40% (15.76–17.06) any diagnosis; 6.91% (6.38–7.47) first diagnosis Psychotic disorder: 2.89% (2.62–3.18) any diagnosis; 0.89% (0.72–1.09) first diagnosis Substance abuse disorder: 8.56% (8.10–9.04) any diagnosis; 2.09% (1.82–2.40) first diagnosis Insomnia: 5·95% (5·53–6·39) any diagnosis; 3.14% (2.81–3.51) first diagnosis **KQ2:** a) Hazard ratio (95% CI) of first MH disorder diagnosis within 180 days of COVID-19 diagnosis among people hospitalized for COVID-19 vs outpatients: Mood, anxiety, or psychotic disorder 1.55 (1.40–1.71) p<0.0001 Mood disorder 1.53 (1.33–1.75) p<0.0001 Anxiety disorder 1.49 (1.34–1.65) p<0.0001 Psychotic disorder 2.77 (1.99–3.85) p<0.0001 Substance use disorder 1.68 (1.40–2.01) p<0.0001 Insomnia 1.49 (1.28–1.74) p<0.0001 b) Hazard ratio (95% CI) of first MH disorder diagnosis within 180 days of COVID-19 diagnosis among people admitted to Intensive Treatment Unit (ITU) vs non-ITU ward: Mood, anxiety, or psychotic disorder 2.27 (1.87–2.74) p<0.0001 Mood disorder 2.06 (1.57–2.71) p<0.0001 Anxiety disorder 2.22 (1.82–2.71) p<0.0001 Psychotic disorder 1.77 (0.98–3.20) p=0.072 Substance use disorder 2.53 (1.83–3.50) p<0.0001 Insomnia 1.93 (1.46–2.55) p<0.0001

Author Year Study design Sample Size Country	Population	How diagnosed with COVID-19	Timing & When Outcomes Measured	Comparator (if applicable)	Outcomes
					KQ3: a) Hazard ratio (95% CI) of any MH disorder diagnosis within 180 days of COVID-19 diagnosis among people hospitalized for COVID-19 vs outpatients: Mood, anxiety, or psychotic disorder 1.23 (1.18–1.28) <0.0001 Mood disorder 1.21 (1.15–1.28) <0.0001 Anxiety disorder 1.16 (1.10–1.22) <0.0001 Psychotic disorder 2.22 (1.92–2.57) <0.0001 Substance use disorder 1.53 (1.42–1.64) <0.0001 Insomnia 1.08 (0.99–1.18) 0.088 b) Hazard ratio (95% CI) of any MH disorder diagnosis within 180 days of COVID-19 diagnosis among people admitted to Intensive Treatment Unit (ITU) vs non-ITU ward: Mood, anxiety, or psychotic disorder 1.34 (1.24–1.46) <0.0001 Mood disorder 1.15 (1.03–1.27) p=0.010 Anxiety disorder 1.39 (1.26–1.53) p<0.0001 Psychotic disorder 1.48 (1.14–1.92) p=0.0028 Substance use disorder 1.62 (1.41–1.85) p<0.0001 Insomnia 1.40 (1.19–1.66) p<0.0001
Turan 2021[17] Cross-sectional N= 892 (89 who requested psychiatric	Age: mean 55.66 Sex: 53.7% female Race: NR Comorbidities: 48.6% chronic medical condition, 5.7% prior neuropsychiatric diagnosis	RT-PCR	Mar 10 - Jun 26 2020 During hospitalization (median: 3rd day of hospitalization)	None	**KQ4:** 89 out of 892 (10%) requested psychiatric consultation. Of these, reasons for consultation were: psychomotor agitation/restlessness (25.8%), impairment of sleep (23.6%), evaluation of prior psychiatric treatments (16.7%), anxiety/fear (14.6%), suicidal ideation (9%), refusal of medical treatment (4.5%), crying spells (3.4%), confusion (3.4%), suicidal attempt (1.1%), loss of appetite (1.1%).

Author Year Study design Sample Size Country	Population	How diagnosed with COVID-19	Timing & When Outcomes Measured	Comparator (if applicable)	Outcomes
consultations analyzed) Turkey					
Wang 2021[18] Cross-sectional N=460 China	Stratified random sample of hospitalized patients in isolation for COVID-19 at 13 medical centers in Hubei province: Age: 17.17% <17 years; 48.26% 18-44 yrs; 34.57% >45 yrs Sex: 64.57% female Race: NR Comorbidities: 29.35% concomitant disease	Unclear (only 38.04% positive on nucleic acid test)	Feb 2 - Mar 5 2020 During hospitalization	Subgroups vs each other	**KQ1**: Depression (PHQ-9 >=5): 53.48% (5.87% severe/PHQ-9>=20) Anxiety (GAD-7>=5): 46.30% (8.91% severe/GAD-7>=15) Insomnia (ISI>=8): 42.01% (2.70% severe/ISI>=22) Self-mutilating or suicidal thoughts (single item on PHQ-9): 23.26% (2.83% severe) **KQ2:** Female COVID-19 patient individuals reported a higher incidence of in insomnia (OR, 1.49; 95% CI, 1.07–2.09 [P = 0.019]), anxiety (OR, 1.64; 95% CI, 1.21–2.23 [P = 0.001]), suicidal ideation (OR, 1.97; 95% CI, 1.17–3.32 [P = 0.011]), and depression (OR, 2.17; 95% CI, 1.48–3.18 [P < 0.001]) than male patients. Patients <17 years old had less insomnia in comparison with the patients >45 years old (OR, 0.42; 95% CI, 0.25–0.70 [P = 0.001])

Abbreviations: BDI-13; 13-Item Beck Depression Inventory; CI= Confidence Interval; GAD-7= 7-Item Generalized Anxiety Disorder scale; IES-R= Impact of Event Scale; KQ=Key Question; NA=Not applicable; NR=Not reported; NSRD=No self-reported depression; OCI= Obsessive Compulsive Inventory; OR= Odds ratio; PCL-5= PTSD Checklist for DSM-5; PHQ-2= 2-Item Patient Health Questionnaire; PHQ-9= 9-Item Patient Health Questionnaire; PSQI= Pittsburgh Sleep Quality Index; Pts=patients; SAS= Zung Self-Rating Anxiety Scale; SD=Standard Deviation; SDS=Zung Self-Rating Depression Scale; STAI-Y= State-Trait Anxiety Inventory-Y; SRD=Self-reported depression; WHIIRS= Women's Health Initiative Insomnia Rating Scale; ZDS= Zung Self-rated depression scale

CROSS-SECTIONAL STUDIES – QUALITY ASSESSMENT KEY

1. Were the criteria for inclusion in the sample clearly defined?
ESP Key: Yes=Complete inclusion/exclusion criteria provided. Unclear=Some inclusion/exclusion criteria provided but some key information is missing. No= No inclusion/exclusion criteria provided. NA=Not applicable
2. Were the study subjects and the setting described in detail?
ESP Key: Yes= Pt characteristics including demographics (age, sex, race/ethnicity, comorbidities), COVID-19 severity, location, and time period provided Unclear= Some info on patient characteristics provided but some key information is missing. No= No meaningful description of study population provided. NA=Not applicable
3. Was the exposure measured in a valid and reliable way?
ESP Key: NA for all studies- exposure is the same as the condition for this report.
4. Were objective, standard criteria used for measurement of the condition?
ESP Key: Yes= Confirmation of COVID-19 via laboratory testing Unclear=Presumed COVID-19 based on clinical guidance or symptoms No= No criteria provided or criteria were inappropriate for capturing COVID-19 status. NA=Not applicable
5. Were confounding factors identified?
ESP Key: Yes= Authors provide complete information on pre-existing MH disorders and other relevant confounders. Unclear= Authors provide some information on MH disorders or other relevant confounders, but it's incomplete. No= Authors do not provide any information on potential confounders. NA= Not applicable

6. Were strategies to deal with confounding factors stated?
ESP Key: Yes= Appropriate matching or stratifying processes used to adjust for potential confounders. Unclear= Authors attempted to control for confounders but information is missing on the methods used or results found. No= No matching or stratifying process used NA= Not applicable
7. Were the outcomes measured in a valid and reliable way?
ESP Key: Yes= Used diagnostic assessment or validated tool to measure outcomes Unclear= Missing information on how outcomes were measured. No= Non-validated tools used to measure outcomes. NA=Not applicable
8. Was appropriate statistical analysis used?
ESP Key: Yes=Appropriate statistical analysis used and results of analyses were reported. Unclear= Some missing information on either statistical analysis used or reported data. No= No statistical analysis conducted. NA= Not applicable

COHORT STUDIES – QUALITY ASSESSMENT KEY

1. Were the two groups similar and recruited from the same population?
ESP Key: Yes= Inclusion/exclusion criteria described, a table comparing patient characteristics in 2 groups provided, and no significant baseline differences between groups. Unclear=Incomplete or no description of inclusion/exclusion criteria, patient characteristics, and/or assessment of differences between groups. No= Inconsistent inclusion/exclusion criteria used between groups or considerable differences between groups at baseline.
2. Were the exposures measured similarly to assign people to both exposed and unexposed groups?
ESP Key: Yes= Same COVID-19 diagnostic criteria used for both groups Unclear= Unclear whether 2 groups used same COVID-19 diagnostic criteria No= Different COVID-19 diagnostic criteria used for each group. NA=Not applicable
3. Was the exposure measured in a valid and reliable way?
ESP Key: Yes= Confirmation of COVID-19 via laboratory testing Unclear=Presumed COVID-19 based on clinical guidance or symptoms No= No criteria provided or criteria were inappropriate for capturing COVID-19 status. NA=Not applicable
4. Were confounding factors identified?
ESP Key: Yes= Authors provide complete information on pre-existing MH disorders and other relevant confounders. Unclear= Authors provide some information on MH disorders or other relevant confounders, but it's incomplete. No= Authors do not provide any information on potential confounders. NA= Not applicable
5. Were strategies to deal with confounding factors stated?
ESP Key:

Yes= Appropriate matching or stratifying processes used to adjust for potential confounders. Unclear= Authors attempted to control for confounders but information is missing on the methods used or results found. No= No matching or stratifying process used NA= Not applicable
6. Were the groups/participants free of the outcome at the start of the study (or at the moment of exposure)?
ESP Key: Yes= Confirmed that patients do not have MH outcome at start of study, or it is impossible that they would have MH outcome. Unclear= Unclear if patients had MH outcome at start of study. No= Some or all patients had MH outcome at start of study. NA=Not applicable
7. Were the outcomes measured in a valid and reliable way?
ESP Key: Yes= Used diagnostic assessment or validated tool to measure outcomes Unclear= Missing information on how outcomes were measured. No= Non-validated tools used to measure outcomes. NA=Not applicable
8. Was the follow up time reported and sufficient to be long enough for outcomes to occur?
ESP Key Yes= follow-up was reported and long enough for outcome to occur. Unclear= Unclear what the follow-up time period was. No= Follow-up too short for outcome to occur. NA= Not applicable
9. Was follow up complete, and if not, were the reasons to loss to follow up described and explored?
ESP Key Yes= Attrition <20% and reasons for dropout were explained. Unclear= Unclear % who dropped out and/or unclear reasons for drop out

No= Attrition >20% or reasons for reasons for dropout are different between groups NA= Not applicable
10. Were strategies to address incomplete follow up utilized?
ESP Key Yes= Data from drop-outs are accounted for appropriately in analysis. Unclear= Unclear how data from drop-outs were handled No= Data from drop-outs not appropriately handled in analysis. NA= Not applicable
11. Was appropriate statistical analysis used?
ESP Key: Yes=Appropriate statistical analysis used and results of analyses were reported. Unclear= Some missing information on either statistical analysis used or reported data. No= No statistical analysis conducted. NA= Not applicable

QUALITY ASSESSMENT OF INCLUDED STUDIES WITH ≥ 200 PARTICIPANTS

CROSS-SECTIONAL STUDIES

Author Year	Criteria for inclusion in the sample clearly defined?	Study subjects and the setting described in detail?	Exposure measured in a valid and reliable way?	Objective, standard criteria used for measurement of the condition?	Confounding factors identified?	Strategies to deal with confounding factors stated?	Outcomes measured in a valid and reliable way?	Appropriate statistical analysis used?	Overall
Chamberlain 2021[2]	Yes; complete inclusion/exclusion criteria provided.	Unclear; No information on race or COVID-19 severity, but reported information on age, sex, and comorbidities.	NA	Unclear; diagnosis based on "Diagnosis and Treatment Protocol for Novel Coronavirus Pneumonia"	Yes; reported prevalence of chronic medical illnesses in the sample and excluded those with mental illness	NA; Pts did not have preexisting mental illness so no need for stratification	No; no measures listed, only individual items without citations or measures referenced	NA (not a comparative study)	Poor quality
Chen 2021[3]	Unclear if there were specific inclusion criteria other than being hospitalized for COVID.	No; age & sex provided but not race, comorbidities or COVID severity	NA	No; no description of how COVID status was ascertained	No; no information on pre-existing MH disorders or other potentially relevant confounders	No; No controlling for pre-existing MH disorders in analysis	Yes; validated MH measurements	Yes; for association of sociodemographic and other factors on MH symptoms	Poor quality
Einvik 2021[4]	Yes; complete inclusion/exclusion criteria provided in Figure 1	Yes; All information reported (born in Norway reported instead of race).	NA	Yes; positive polymerase chain reaction test	Unclear; authors report "NA" for % of hospitalized pts with depression	Unclear; authors evaluated determinants of PTSD scores including "history of depression" but only among non-hospitalized patients.	Yes; validated measurement of PSTD	Yes, for assessing association between pt characteristics and MH scores	Fair quality

Author Year	Criteria for inclusion in the sample clearly defined?	Study subjects and the setting described in detail?	Exposure measured in a valid and reliable way?	Objective, standard criteria used for measurement of the condition?	Confounding factors identified?	Strategies to deal with confounding factors stated?	Outcomes measured in a valid and reliable way?	Appropriate statistical analysis used?	Overall
Islam 2021[5]	Yes; complete inclusion/exclusion criteria provided.	Unclear; age, sex, comorbidities reported but not COVID severity (only persistent COVID symptoms reported).	NA	Unclear; COVID diagnosis was self-reported	Unclear; some information on comorbidities but no information on preexisting MH conditions	No; No controlling for pre-existing MH disorders in analysis	Yes; validated measurement of depression	Yes, for comparison of subgroups	Fair quality
Jiang 2020[6]	Yes; complete inclusion/exclusion criteria provided.	Yes; No information on race, but reported information on age, sex, comorbidities, and COVID-19 severity	NA	Unclear; cases confirmed either through RT-PCR swab or chest CT scanning	Unclear; some information on comorbidities but no information on preexisting MH conditions	No; No controlling for pre-existing MH disorders in analysis	Yes; validated measures of MH outcomes	Yes, for assessing association between pt characteristics and MH scores	Fair quality
Li 2020[7]	Yes; complete inclusion/exclusion criteria provided.	Unclear; No information on race or COVID-19 severity, but reported information on age, sex, and comorbidities.	NA	Unclear; diagnosis based on "Diagnosis and Treatment Protocol for Novel Coronavirus Pneumonia"	Yes; reported prevalence of chronic medical illnesses in the sample and excluded those with mental illness	NA; Pts did not have preexisting mental illness so no need for stratification	No; no measures listed, only individual items without citations or measures referenced	NA (not a comparative study)	Poor quality

Author Year	Criteria for inclusion in the sample clearly defined?	Study subjects and the setting described in detail?	Exposure measured in a valid and reliable way?	Objective, standard criteria used for measurement of the condition?	Confounding factors identified?	Strategies to deal with confounding factors stated?	Outcomes measured in a valid and reliable way?	Appropriate statistical analysis used?	Overall
Liu 2020[8]	Yes; report inclusion of all patients and 90% response rate	Yes; No information on race, but reported information on age, sex, comorbidities, and COVID-19 severity	NA	No; No criteria provided	Unclear; some information on comorbidities but no information on preexisting MH conditions	No; No controlling for pre-existing MH disorders in analysis	Yes; validated measures of MH outcomes	Yes, for OR estimates according to demographics, disease severity, *etc*	Fair quality
Ma 2020[9]	Yes; complete inclusion/exclusion criteria provided and 98% compliance.	Unclear; No information on race or comorbidities, but reported information on age, sex, and COVID-19 severity	NA	Unclear; diagnosis based on Diagnosis and Treatment Protocol for Novel Coronavirus Pneumonia (Trial Version 6) in China	Unclear; no discussion of comorbidities or information on preexisting MH conditions	No; No controlling for pre-existing MH disorders in analysis	Yes; validated measures of MH outcomes	NA (not a comparative study)	Fair quality
Mandal 2020[10]	Yes; complete inclusion/exclusion criteria provided in supplementary data file	Yes; All information reported.	NA	Yes; via nasopharyngeal swab	Unclear; some information on comorbidities but no information on preexisting MH conditions	No; No controlling for pre-existing MH disorders in analysis	Yes; validated measurement of depression	NA (not a comparative study)	Fair quality

Author Year	Criteria for inclusion in the sample clearly defined?	Study subjects and the setting described in detail?	Exposure measured in a valid and reliable way?	Objective, standard criteria used for measurement of the condition?	Confounding factors identified?	Strategies to deal with confounding factors stated?	Outcomes measured in a valid and reliable way?	Appropriate statistical analysis used?	Overall
Mazza 2020[12]	Yes; complete inclusion/exclusion criteria provided.	Yes; No information on race, but reported information on age, sex, comorbidities, and COVID-19 severity	NA	No, no criteria provided	Yes; reports previous psychiatric history	Yes; previous psychiatric history was included in analyses	Yes; validated measures of MH outcomes	Yes, for comparisons of hospitalized vs outpatient COVID-19 patients	Fair quality
Moradian 2020[19]	Yes; complete inclusion/exclusion criteria provided.	Unclear; no information on race or COVID-19 severity (other than all were moderate or severe), but reported information on age, sex, and comorbidities.	NA	Yes; via real-time reverse transcriptase PCR of nasal and pharyngeal swab	Unclear; some information on comorbidities but no information on preexisting MH conditions	No; No controlling for pre-existing MH disorders in analysis	No; no measures listed	NA (not a comparative study)	Poor quality
Moayed 2021[13]	Unclear; inclusion/exclusion criteria provided but authors only mention these are hospitalized patients in the discussion section.	Unclear; no information on race or COVID-19 severity, but reported information on age, sex, and comorbidities.	NA	Unclear; no information on how COVID was diagnosed	Unclear; some information on comorbidities but no information on preexisting MH conditions	No; No controlling for pre-existing MH disorders in analysis	Unclear; Depression Anxiety Stress Scale used but description of scale cut-offs does not match the categories reported in the results section.	Yes, for assessing association between pt characteristics and MH scores	Poor quality

Author Year	Criteria for inclusion in the sample clearly defined?	Study subjects and the setting described in detail?	Exposure measured in a valid and reliable way?	Objective, standard criteria used for measurement of the condition?	Confounding factors identified?	Strategies to deal with confounding factors stated?	Outcomes measured in a valid and reliable way?	Appropriate statistical analysis used?	Overall
Sahan 2021[14]	No; not clear if there were specific inclusion criteria other than being hospitalized for COVID.	Unclear; no information on race or COVID-19 severity, but reported information on age, sex, and comorbidities.	NA	Unclear; diagnosed according to the Turkish Ministry of Health guideline	Yes; 25% had lifetime psychiatric disorders	Yes; HADS scores calculated for those w/ vs w/out lifetime psychiatric disorder	Yes; validated measures of MH outcomes	Yes, for evaluating association between pt characteristics and HADS score	Fair quality
Wang 2021[18]	Yes; major inclusion/exclusion criteria provided	No; age & sex provided but not race. Comorbidities reported as % with "concomitant disease"- unclear if this is physical or mental health. Percent who needed oxygen is a proxy for COVID severity	NA	No; no description of how COVID status was ascertained, but 62% were negative on nucleic acid test	No; no information on pre-existing MH disorders or other potentially relevant confounders	No; No controlling for pre-existing MH disorders in analysis	Yes; validated MH measurements	Yes; for analysis of risk factors for MH symptoms	Poor quality

Abbreviations: MH=Mental health; NA=Not applicable; PCR= Polymerase Chain Reaction; Pts=Patients

COHORT STUDIES

Author Year	Two groups similar and recruited from the same pop-ulation?	Exposure measured similarly to assign people to groups?	Exposure measured in a valid and reliable way?	Confound-ing factors identified?	Strategies to deal with confound-ing factors stated?	Groups /ppts free of the outcome at the start of the study?	Outcomes measured in a valid and reliable way?	Follow-up time reported and long enough for outcome to occur?	Follow- up was complete, or reasons for loss to follow up described and explored?	Strategies to address incomplete follow-up utilized?	Approp-riate statistical analysis used?	Overall
Atalla 2020[1]	Yes; full inclusion criteria stated	Yes; same diagnostic method used for all ppts	Yes; PCR	Yes; MH co-morbidities reported	No; no matching or other adjustment	No; some ppts had preexisting MH disorders at study start	Yes; healthcare utilization measure was appropriate	Yes; adequate length of follow up	Yes; no attrition as data were collected from chart review	Yes; no dropouts	Yes, appropriate statistical analysis methods used	Fair quality
Mario Gennaro 2021[11]	Yes, full inclusion criteria stated	Yes, same diagnostic method used for all participants	Yes, PCR	Unclear; presence/absence of previous psychiatric history reported, but not what these disorders were	Yes; those w/ and w/out previous psychiatric history analyzed separately	Yes; analyses conducted for those w/out psychiatric history	Yes, validated outcome assessment tools	Yes, adequate length of follow up	No; 44% of initial cohort dropped out, unclear reasons for drop-out but drop-outs were similar to completers	No; data from drop-outs not included in 3-month estimates	Yes, for associations between pt character-istics and outcomes	Fair quality

Author Year	Two groups similar and recruited from the same pop-ulation?	Exposure measured similarly to assign people to groups?	Exposure measured in a valid and reliable way?	Confound-ing factors identified?	Strategies to deal with confound-ing factors stated?	Groups /ppts free of the outcome at the start of the study?	Outcomes measured in a valid and reliable way?	Follow-up time reported and long enough for outcome to occur?	Follow- up was complete, or reasons for loss to follow up described and explored?	Strategies to address incomplete follow-up utilized?	Approp-riate statistical analysis used?	Overall
Taquet 2020[15]	Yes; full inclusion criteria stated	Yes; same diagnostic method used for all ppts	Unclear; multiple criteria stated	Yes; MH co-morbidities reported	Yes; matching of groups based on 28 variables affecting risk of COVID and 22 variables affecting risk of control health events	Yes; analyses conducted with only those who did not have preexisting MH disorders	Yes; ICD-10 codes of psychiatric diagnoses appropriate	Yes; adequate length of follow up	Yes; no attrition as data were collected from chart review	Yes; no dropouts	Yes, appropriate statistical analysis methods used	Good quality

Author Year	Two groups similar and recruited from the same pop-ulation?	Exposure measured similarly to assign people to groups?	Exposure measured in a valid and reliable way?	Confound-ing factors identified?	Strategies to deal with confound-ing factors stated?	Groups /ppts free of the outcome at the start of the study?	Outcomes measured in a valid and reliable way?	Follow-up time reported and long enough for outcome to occur?	Follow- up was complete, or reasons for loss to follow up described and explored?	Strategies to address incomplete follow-up utilized?	Approp-riate statistical analysis used?	Overall
Taquet 2021[16]	Yes; full inclusion criteria stated & supple-mentary materials compare those with COVID vs matched cohorts with other illnesses at baseline	Yes; same ICD-10 code used for all COVID-19 pts	Unclear, ICD-10 code indicates virus was identified but unclear how	Unclear; detailed data were provided on ppts' medical comorbiditi es but only MH data was on ppts' baseline substance misuse (Supple-mentary Materials)	Unclear; cohorts matched for medical comorbiditie s, but no adjustment for pre-existing MH disorders.	Yes; since study measured incidence, all outcomes are by definition new outcomes	Yes, ICD-10 codes of psychiatric diagnoses appropriate	Yes, adequate length of follow up	Yes; no attrition as data were collected from chart review	Yes; no dropouts	Yes, appropriate statistical analysis methods used	Fair quality

Author Year	Two groups similar and recruited from the same pop-ulation?	Exposure measured similarly to assign people to groups?	Exposure measured in a valid and reliable way?	Confound-ing factors identified?	Strategies to deal with confound-ing factors stated?	Groups /ppts free of the outcome at the start of the study?	Outcomes measured in a valid and reliable way?	Follow-up time reported and long enough for outcome to occur?	Follow- up was complete, or reasons for loss to follow up described and explored?	Strategies to address incomplete follow-up utilized?	Approp-riate statistical analysis used?	Overall
Turan 2021[17]	Yes; full inclusion criteria stated	Yes; same WHO criteria used for all pts (note-both confirmed and probable COVID-19 pts included)	Yes; COVID-19 confirmed via RT-PCR assay	Unclear; some information provided on preexisting neuropsychiatric conditions in Table 3 but it does not include all MH conditions of interest	No; no matching or other adjustment	Yes; since study measures health care utilization, all events are new events.	Yes; information on consultations drawn from medical record data	Yes, outcomes presumably measured during hospitalization	Yes; no attrition as data were collected from chart review	Yes; no dropouts	Yes, appropriate statistical analysis methods used	Good quality

Abbreviations: MH=Mental health; PCR= Polymerase Chain Reaction; Ppts=Participants

PEER REVIEW COMMENTS (OCT 2020 VERSION)

Comment #	Reviewer #	Comment	Author Response
Are the objectives, scope, and methods for this review clearly described?			
1	1	Yes	None
2	3	Yes	None
3	4	Yes	None
4	7	Yes	None
Is there any indication of bias in our synthesis of the evidence?			
5	1	No	None
6	3	No	None
7	4	No	None
7	7	No	None
Are there any published or unpublished studies that we may have overlooked?			
9	1	No	None
10	3	No	None
11	4	No	None
12	7	No	None
Additional suggestions or comments can be provided below. If applicable, please indicate the page and line numbers from the draft report.			
13	1	This review is thorough and does a good job of reviewing the limited number of studies available on this topic. In some respects, given the limited literature, I think the review could have been substantially shorter but as a living review they have provided a good framework for adding additional studies.	Thank you – we will keep the framework as is as we anticipate there will be more relevant, published studies soon.
14	1	The one recommendation I would make is that they more clearly lay out a framework for the different ways COVID might impact mental health outcomes, which lend themselves to different questions and different comparisons and subgroup analyses. It also depends on whether the aim of the review is predicting the burden of disease in which case simple prevalence studies may suffice, or whether they are meant to explore casual hypotheses, in which case more careful selection of control groups is needed.	We aimed to both estimate the burden of disease and to explore potential causal pathways. In response to this comment, we have rephrased the Key Questions and PICOs so it's clearer which questions assess overall burden of disease and therefore have no comparator (KQ1, KQ4, & KQ5) and which questions assess potential causal pathways and therefore have a comparator (KQ2, KQ2a, KQ2b, KQ2c, KQ3, KQ3a, KQ3b, KQ3c, KQ4a, KQ4b, KQ4c, KQ4d).

Comment #	Reviewer #	Comment	Author Response
15	1	As I see it there are at least three distinct pathways: 1) Direct neuropsychiatric effects – these may depend on severity but may not be limited to hospitalized patients. Clearly controlling for pre-existing MH condition is important, but so is exploring individual effects on different MH conditions. An important question for Veterans due to the high prevalence of pre-existing MH conditions is whether that predisposes them to effects of virus.	We revised the key questions so that KQs 2-2c assess the development of new MH symptoms or disorders in those with no preexisting conditions and KQs 3-3c assess the exacerbation of MH symptoms in those with preexisting MH conditions. Assessing risk factors for either contracting COVID-19 or being hospitalized for COVID-19 are outside the scope of this review. However, we comment that VA-using Veterans have high rates of mental health disorders in the background and discussion and discuss how this might increase their risk of being hospitalized for COVID-19.
16	1	As I see it there are at least three distinct pathways: 2) Effects of hospitalization, especially severe illness/ICU care. a. Effects specific to virus – this requires a similarly sick control group. This is the one point that is omitted in the discussion and recommendations for future research. From a predictive point, it may not matter as much whether the outcomes are caused by the illness itself/treatment or something unique about COVID but it does matter from an etiologic perspective to know whether COVID is different from severe influenza. Some of this may also reflect that COVID patients are more isolated in the hospital than other ill patients – what is the impact of being in hospital with less regular interaction with nurses and all those interactions hindered by PPE? b. Effects of severe illness/ICU care itself – teasing this out requires closer attention to the level of care in the hospital. We already know about the effects of prolonged hospitalization and ICU care in particular. But comparing outcomes relative to the level of illness would help – *ie*, an analysis that compared non-hospitalized infection, hospitalized/no ICU and hospitalized + ICU.	In response to item a- we have revised the KQs so that KQ2b and 3b now compare patients hospitalized for COVID-19 to patients hospitalized for other causes. In response to item b- we have revised the KQs so that KQ2a and 3a compare patients hospitalized for COVID-19 to patients with outpatient COVID-19. We have also specified in KQ2c and 3c that we're interested in whether development/exacerbation of MH disorders differs by "COVID-19 disease severity" or "level of care." In response to both items, we also added an additional bullet to the "gaps and future research needs" that recommends researchers compare patients who have been hospitalized for COVID-19 to relevant control groups, including those listed in the KQs.
17	1	Given the broad inclusion criteria, I would have liked to know more about the 17 studies included based on abstract but excluded based on full article.	See Supplementary Materials, "List of excluded studies" section for the list of studies we excluded as well as the reasons why we excluded them.

Comment #	Reviewer #	Comment	Author Response
18	1	Some acknowledgment should be made of the other effects of the pandemic response on MH. *Ie* that some of the MH effects post discharge may also reflect the continuing effect of the pandemic – economic uncertainty, social isolation. This point should also be included in future studies that you cant assess MH in isolation of other social stressors on a patient.	Paragraph 4 of the Background section discusses the underlying effects of the pandemic on mental health, and the risk that patients hospitalized for COVID-19 are returning home to stressful environments. In the Future Research Needs section, we also comment that the development of post-COVID-19 hospitalization mental health screening tools should include items assessing "other concerns stemming from the COVID-19 pandemic that could impact mental health (*eg*, loss of employment, separation from loved ones, anxiety about possible reinfection, *etc*)."
19	3	Very well done! Appropriate methods, well written and clear. As noted, the literature has not yet matured to the point of providing any real answers to the questions posed. The limitations and cautions about MH outcome assessment in this context are well laid out in the discussion.	Thank you.
20	3	A couple minor suggestions: - consider putting information about timing of outcome assessment into the in-text tables. For example, with KQ1 it took me a couple reads to identify timing - it is in the narrative part of the results, but it is an important piece of information and you might consider making more visible by putting in table	We added the missing information on outcome measurement timing to tables as appropriate.
21	3	Consider more clearly defining the outcomes in the methods - in particular to distinguish between symptoms and disorders (obviously they are related, but also different as you nicely point out in the discussion). Some studies may simply not have been designed to answer the question about disorders, but they may be able to provide information about the prevalence of various symptoms. Again, the information is all there, just a matter of slight tweaks to organization/subheadings	Under "Key Questions and eligibility criteria," under the "outcomes" column, we clarified that we were interested in both diagnoses & symptoms.

Comment #	Reviewer #	Comment	Author Response
22	3	Consider tweaking the wording of some of the questions to guide living review organization. There are different things people would want to know about COVID and its effects on mental health. One might be the extent to which people with known MH comorbidities are getting COVID and whether they are disproportionately represented among those with COVID. Another might be whether COVID exacerbates the severity of MH symptoms in people with and without known MH diagnoses. Another might be the incidence of MH disorders after COVID related hospitalization (which is kind of what KQ1a is, but not quite). Again, the studies are all there, but I suspect moving forward more evidence will emerge and it may be helpful to bucket them in a slightly different way.	We revised the KQs so that KQ2-2c now focus on development of new MH disorders or symptoms among those without preexisting MH disorders while KQ3-3c focus on exacerbation of MH symptoms in those with preexisting MH disorders. Determining whether patients with mental health disorders have a higher risk of being hospitalized with COVID-19 is outside the scope of this review, although we comment that some mental health disorders such as depression may be a risk factor for COVID-19 hospitalization in the discussion section, under “limitations.”
23	4	Thank you for the opportunity to review this timely and ongoing review of mental health outcomes of adults hospitalized for COVID-19. I appreciate that there are only 2 papers that met criteria so far, and I understand that the review will likely change as other papers become available.	None.
24	4	My major concern is that the aims are a bit trite and could have been framed in a more meaningful fashion. For example, the big questions that needs answering are: 1) Is COVID hospitalization causal with respect to new onset psychiatric disorders? If so, in what way? Is it the illness itself (or its severity) or a side effect of treatment?	We revised KQ2, KQ2a, KQ2b, KQ2c, KQ3, KQ3a, KQ3b, and KQ3c to compare patients hospitalized for COVID-19 to specific control groups (vs before hospitalization, vs people with outpatient COVID-19, vs people hospitalized for other causes, vs subgroups that vary by COVID-19 severity and level of care). These types of comparisons will provide initial information on potential causal pathways between COVID-19 and outcomes.
25	4	2) Does COVID hospitalization exacerbate existing psychiatric disorders? Again, in what way? And I would add a third question:	We revised KQ3-3c to assess whether hospitalization for COVID exacerbates MH symptoms among those with preexisting MH disorders.
26	4	3) Are those with psychiatric disorders (can be specific as to MDD, PTSD, GAD, SUD *etc*) at increased risk of COVID hospitalization? at increased risk of being COVID positive? These are more meaningful questions than the current aims, and would make for a much more meaningful introduction and discussion sections, with more clearcut implications for action. This reframing would not change the other sections markedly.	Determining whether patients with mental health disorders have a higher risk of being hospitalized with COVID-19 is outside the scope of this review. However, we comment that some mental health disorders such as depression may be a risk factor for COVID-19 hospitalization in the discussion section, under “limitations.”

Comment #	Reviewer #	Comment	Author Response
27	4	More minor concerns: 1) Include the purpose/aims in the executive summary before key findings.	Added a sentence on the purpose of the review to the executive summary.
28	4	2) What were the other 2 reviews conducted? Not essential, but helpful as background info.	Added a sentence indicating the first 2 reviews will focus on major organ damage and rehabilitation needs.
29	4	3) 3/14-20 and 8/57 and following: This is a pretty sweeping statement. Please specify if this is for VA patients or veterans in general (including veterans who don't use the VA).	Clarified that these statistics are for Veterans who receive care at the VA.
30	4	4) 3/26-31: specify if you mean pre-COVID, post-COVID, or concurrent prevalence of mental disorders. MH services use patterns and needs may be different for each of these categories.	Clarified that we were interested in adult patients during and after hospitalization for COVID-19.
31	4	5) 5/27: Can we really call these "outcomes" since there are no comparators and no-hospital data? Outcomes connotes a time ordering as well as implied causality.	We agree that the evidence is overall too weak to establish a causal relationship between COVID-19 hospitalization and during/post-hospitalization MH disorders. We have kept in the term “outcome” to maintain consistent language throughout the report since we use the term “outcome” in our methods to describe the type of data we were looking for (see “Eligibility criteria” section). We believe using the same term throughout the report will make it easier for readers to track what we looked for vs what we found. However, we have also clarified the type of data and made sure to refrain from causal language in this report.
32	4	6) 6/7: "Long-term prevalence" is not an epidemiological term. This should be incidence.	Changed to incidence and clarified these would be new mental health disorders diagnosed 3 and 6 months after discharge.
33	4	7) 7/1st para of background: change to past tense	Put applicable sentences in past tense.
34	4	8) Table 2: Yuan study: provide cutpoint and interpretation for Zung SDS. Also, for Zarghani, who diagnosed psychiatric disorders? Was there an instrument?	For Yuan 2020, we added that self-reported depressive symptoms were equivalent to SDS score >50. For Zharghami 2020, we added a sentence that psychiatric disorders were diagnosed by a psychiatrist, but that the specific diagnostic criteria were not reported.

Comment #	Reviewer #	Comment	Author Response
35	4	9) Note: I would not call the SDS or PHQ9 or GAD7 "self-report instruments." They are screening instruments as opposed to diagnostic instruments (*eg*, CIDI, MINI, CAPS) -- which are also self-report. The distinguishing feature is not self-report, but rather whether they are screening/symptom counting or diagnostic in nature. And of course these methods are in contrast to pure clinical diagnoses which are notoriously unreliable.	Throughout the report, we removed the reference to "self-reported" symptoms and instead refer to these as symptoms. Elsewhere, we refer to the PHQ-9 and GAD-7 as "symptom screening tools" (p. 17, table 2; p. 18, table 3).
36	4	10) Technically, prevalence is not a rate (see Table 2, also 16/para 1, Table 3, 19/25 and throughout the ms). Instead of rate, just say prevalence.	Replaced "rate" with "prevalence" as appropriate.
37	4	11) Table 4: Since this is a study of patients post-hospitalization (presumably during the 2 week post-hospitalization quarantine period), the reporting in the prevalence column should be reversed. For example, of those with comorbidities, x% had SDS depression compared to y% of those with no comorbidities. Should be the same for gender (x% of males had SDS depression compared to y% of females) and all other variables.	Revised this table so it now reports the prevalence of depression by subgroup of interest.
38	4	12) 19/Discussion: Clinicians treating COVID are not psychiatrists, so I am curious as to how diagnosed psychiatric disorders was operationalized.	Added information to the findings section on p. 16 to clarify how psychiatric assessments were carried out in this study (a psychiatrist spoke to patients via video chat with a tablet [inpatient settings] or personal mobile phone [outpatient settings] to complete diagnostic assessments).
39	4	13) Discussion: Identification of psychiatric disorders depends on many factors, including instrumentation (screeners vs diagnostic instruments), clinician training, setting, etc. Mental disorders are typically under-diagnosed in some settings (*eg*, primary care), but more accurately diagnosed in mental health specialty clinics. I would guess that COVID units don't often have mental health specialists on staff, so they likely don't have very refined psychiatric diagnostic capabilities.	In the study that reported diagnoses, psychiatrists were the ones that gave diagnoses, so it is unlikely that provider training or setting contributed to underdiagnosis. However, we agree that lack of mental health specialist involvement in inpatient care may contribute to low rates of diagnoses in clinical settings. We have added a sentence describing this to the discussion section.
40	4	14) Discussion: many psychiatric symptoms likely overlap with COVID symptoms or COVID treatment side effects (*eg*, fatigue, sleep disturbance, agitation).	Added language to indicate that providers may have seen mental health symptoms as symptoms or side-effects of COVID-19 itself, which may have resulted in under-diagnosis.

Comment #	Reviewer #	Comment	Author Response
41	4	Typos, edits needed: 5/22: pre-existing 21/37 22/46	Changed these to “preexisting.”
42	7	The review gave a very clear assessment of its limitations related to the methodology (one reviewer determining inclusion) and the infancy, hence limitation, of research in this domain. Overall, well done.	Thank you.

PEER REVIEW COMMENTS (MARCH 2021 VERSION)

Comment #	Reviewer #	Comment	Author Response
Are the objectives, scope, and methods for this review clearly described?			
1	3	Yes	None
2	4	Yes	None
3	7	Yes	None
Is there any indication of bias in our synthesis of the evidence?			
4	3	No	None
5	4	No	None
6	7	No	None
Are there any published or unpublished studies that we may have overlooked?			
7	3	No	None
8	4	No	None
9	7	No	None
Additional suggestions or comments can be provided below. If applicable, please indicate the page and line numbers from the draft report.			
10	3	Overall looks really good. Appreciated the table which specifies new evidence. Well written and clear. A few suggestions:	Thank you
11	3	- in a couple instances (*eg* - second paragraph of discussion) report states that the prevalence of the MH conditions during hospitalization (depression, anxiety, insomnia, adjustment d/o) was similar or slightly lower during the three months following hospitalization. However, according to the tables, depression and anxiety were the only symptoms for which there were studies reporting prevalence estimate during and after hospitalization - and, as the report states, depression sx prevalence may have been quite different (there was a range) - so really it is only anxiety sx that were similar prevalence during post discharge period if I am reading correctly	We revised the results, discussion and conclusion to indicate that the prevalence of *anxiety* and *insomnia* symptoms, across studies, were similar or slightly lower in the post-hospitalization period, while *depression* symptoms were variable across studies in the post-hospitalization period.

Comment #	Reviewer #	Comment	Author Response
12	3	- I know this is not one of the key questions, but it might be useful somewhere in discussion to give some context for the prevalence numbers during hospitalization: are these numbers high? are they surprising when you consider the general hospitalized population? There are many reasons - many iatrogenic - why insomnia is very common among hospitalized patients (in my experience, the vast majority of hospitalized patients can't sleep well in the hospital). One example is a paper by Freedland KE et al, Psychosomatic Medicine, 2003 - prevalence of depression sx was over 50% among patients hospitalized with congestive heart failure. Again, not something to go into in detail, but it is an area of uncertainty/inquiry that may be worth briefly mentioning	We added information to the background section to indicate patients hospitalized for other reasons often experience MH issues and problems sleeping. We also added a sentence to the discussion section to contextualize the findings: "Although we found no studies directly comparing hospitalized COVID-19 patients to patients hospitalized for other reasons, our included studies' estimates of MH disorder prevalence during hospitalization are similar to prevalence estimates from studies of patients acutely ill with SARS and MERS infections, and patients hospitalized for other serious illnesses."
13	4	- another future studies thing to consider highlighting is the relationship between persistence of MH sx during the 3-6 months (or longer) post COVID and the persistence of COVID sx in general - prolonged or even long-haul COVID and impact on MH sx prevalence.	We added 2 sentences to the "future research needs" section indicating that it is important to evaluate long-term MH outcomes given there is emerging evidence that some people experience long-term effects of COVID-19 (*ie*, long COVID).
14	4	Thank you for undertaking the continuous updating of this important topic. It will be fun for you all (as researchers) and me (as a reviewer) to see how this literature evolves.	No comment
15	4	I am still struggling with the wording and results of Key Question 2. It seems to me that the intent of this question is to get at incidence, that is, the incidence of mental health conditions for those hospitalized with COVID (or is hospitalization for COVID a risk factor for mental health conditions) and then compare that to the incidence of mental health conditions for outpatient COVID patients, etc. The design to answer these questions is a cohort study, or at the very least 2 measurements over time of the condition (mental health problems) under study. I'm uncomfortable with any reference to "prevalence" in the question 2 results and supporting evidence. Additionally, since 2 measurements need to be taken to determine incidence, any strictly cross-sectional studies should be excluded from inclusion in question 2 reporting. I strongly recommend cleaning up the wording and the studies included for this question. The question will be most clearly stated by using the word incidence.	You are correct that we are interested in the incidence of new MH disorders among those with no preexisting MH disorders. The studies we identified were generally not designed to detect incidence (as you point out, most of these were cross-sectional). However, these studies did contain information that was helpful in estimating incidence until more robust data are available. Despite potential limitations, such as measurement bias, recall bias or other systematic error, we extrapolated what we could from the cross-sectional studies that reported prevalence. Our rationale is that most of these cross-sectional studies indicated that the included populations had no, unclear, or low prevalence of preexisting MH disorders. We have changed the description of findings for KQ2 to reflect this rationale and have made sure to describe potential limitations of these studies and preliminary estimates.

Comment #	Reviewer #	Comment	Author Response
16	4	Insomnia is not technically a psychiatric disorder, but often symptomatic of an underlying psychiatric or mental health condition. It can also may have a medical or pharmaceutical etiology. While it is good to include insomnia in the review, please clarify why you are including it along with the above caveats.	We indicated that we were interested in MH disorders “and clinical features such as insomnia” to the scope section. We also indicated that “We included insomnia as an outcome of interest as it often symptomatic of another underlying MH disorder.”

PEER REVIEW COMMENTS (JULY 2021 VERSION)

Comment #	Reviewer #	Comment	Author Response
Are the objectives, scope, and methods for this review clearly described?			
	4	Yes	None
	7	Yes	None
Is there any indication of bias in our synthesis of the evidence?			
	4	No	None
	7	No	None
Are there any published or unpublished studies that we may have overlooked?			
	4	No	None
	7	No	None
Additional suggestions or comments can be provided below. If applicable, please indicate the page and line numbers from the draft report.			
	4	This is an updated review of COVID19-related mental health outcomes to date. As before, the objectives are clear and the results presented in a straightforward manner. My comments are minor, and could be considered to make the update more relevant to the changing nature of COVID19 mental health risk factors.	None
	4	1) Consider more detailed reporting of age-related outcomes. This is important, as younger people are currently lagging in vax rates; therefore, they are at increased risk for disease with mental health sequelae. If there are age breakdowns, reporting these outcomes would increase the relevance to the scene today.	Unfortunately, we identified limited data on age-related differences in MH outcomes. The data we did identify on age appears under Key Question 2C and is summarized in Table 4. To summarize, among populations with either unclear or low prevalence of preexisting MH disorders, older age was associated with worse depression symptoms during hospitalization, but not with PTSD symptoms post-discharge. We did not identify any data on age-related differences in MH outcomes among those with preexisting MH conditions.
	4	2) In the discussion, consider commenting on the changing circumstances regarding hospitalization today. With increased vax rates, there is less isolation and more visitation from vaccinated loved ones. This may serve to decrease rates of depression and anxiety among hospitalized COVID19 patients. I realize this is speculative; however, that's what a discussion is for!	Added the sub-section “Evolving nature of COVID-19 and mental health” to the discussion section. We now describe that daily COVID-19 cases and hospitalizations have decreased this past year in tandem with increasing numbers of vaccinations, that many hospitals are now allowing in-person visitors for hospitalized COVID-19 patients, and this may positively impact patients’ mental health.
	4	3) Also, consider that the baseline prevalence of mental health	In the background section, we state that recent studies on

	symptoms in the general population may be changing. By all accounts in the popular media, we are seeing increasing need for mental health services. An increased baseline of mental health symptomatology would also increase the rates and prevalences seen among hospitalized COVID patients. This, too, would make for a good discussion point.	the COVID-19 pandemic have shown that general populations are experiencing a high prevalence of depression, anxiety, insomnia, and acute stress. We also state in the discussion section that it is important for researchers to report for and account for potential confounders (especially preexisting MH disorders) because the prevalence of post-hospitalization mental health disorders is likely influenced by the prevalence of pre-hospitalization mental health disorders
4	4) In general, you may want to add a paragraph commenting on the changing nature of the COVID environment as a result of vax rates, improved treatments, etc. This would help to acknowledge that things are still very dynamic and we have a lot more to learn.	Added the subsection “Evolving nature of COVID-19 and mental health” to the discussion section to describe that the nature of the COVID-19 has changed over the past year, especially in terms of increasing numbers of people being vaccinated and the availability of FDA-authorized treatments for COVID-19.
4	5) Typos: page 18/45 and 18/53: Should be PTSD	Changed these to “PTSD”
7	One suggestion. I really appreciated the discussion about the wonkiness of the estimates of depression symptoms on page 15 literal page 27 of the PDF), including the statement about having low confidence in the data. I felt this was well represented in the Conclusion (page 24, page 36 of the PDF). However, I feel that the 2nd bullet in the Executive Summary on page 1 (page 13 of PDF) may be overinterpreted by the casual reader as indicating more wide-spread risk and more certainty about the data than may be reasonable. Recommend review and potential revision of that bullet in the Executive Summary.	Revised the second bullet point so we now describe depression symptom prevalence at the end and give caveats indicating that estimates varied across studies due to differences in how symptoms were measured and reported.

REPORT FINDINGS BY DATE

Rapid Evidence Review Question	Oct 2020 - Original Report	March 2021 – Report Update	June 2021- Current Update (Prioritized Studies Only)
KQ1) Among adults who have been hospitalized for COVID-19, what is the prevalence of MH disorders during or after hospitalization?	In 2 studies (1 of a sample of patients with a low prevalence of preexisting MH conditions, and 1 that did not report on patients' preexisting MH conditions), overall prevalence of MH conditions during/immediately after hospitalization were: • **Depression symptoms**: 43.3%-44% (2 fair-quality studies) • **Anxiety symptoms**: 23.3% (1 fair-quality study) • **MDD**: 3.3% (1 fair-quality study) • **GAD**: 6.7% (1 fair-quality study) • **Insomnia**: 43.3% (1 fair-quality study) • **Adjustment disorder**: 26.7% (1 fair-quality study)	In 2 fair-quality cross-sectional studies, the prevalence of MH conditions *during hospitalization* was: • **Depression symptoms:** 43.3%-45.9% (2 studies) • **Anxiety symptoms:** 23.3-38.8% (2 studies) • **Adjustment disorder:** 26.7% (1 study) • **Insomnia:** 43.3-54.1% (2 studies) In 6 fair-quality cross-sectional studies, the prevalence of MH conditions *in the 3 months following hospitalization* was: • **Depression symptoms:** 10-65.7% (5 studies) • **Anxiety symptoms:** 22.2-42.7% (4 studies) • **PTSD symptoms:** 15.4-31% (3 studies) • **Obsessive compulsive symptoms:** 19.6% (1 study) • **Insomnia:** 39.6% (1 study)	In 1 fair-quality cross-sectional study, the prevalence of MH symptoms *during hospitalization* was: • **Depression symptoms:** 42.0% • **Anxiety symptoms:** 34.9% In 5 fair-quality studies, the prevalence of MH symptoms *in the 3 months following hospitalization* was: • **Depression symptoms:** 9-65.7% (1 prospective cohort, 3 cross-sectional) • **Anxiety symptoms:** 30-39% (1 prospective cohort) • **Insomnia symptoms:** 24-39.6% (1 prospective cohort) • **Obsessive compulsive symptoms:** 19.6-26% (1 prospective cohort) • **PTSD symptoms:** 9.5-15.4% (1 prospective cohort, 1 cross-sectional)
KQ2) How often do adults without preexisting MH conditions who have been hospitalized for COVID-19 develop new MH symptoms or a new MH diagnosis?	No evidence.	We did not identify any studies that were designed to detect incidence of new MH disorders among hospitalized COVID-19 patients without preexisting MH conditions. However, the studies described in KQ1 were primarily conducted among those with no or low prevalence of MH disorders of baseline. Therefore, we can extrapolate that most of the MH conditions reported by these studies likely reflect new MH conditions.	In 1 good-quality retrospective cohort study, the incidence of receiving a new MH disorder diagnosis *in the 6 months following hospitalization* was: • **Anxiety disorder:** 6.9% • **Mood disorder:** 4.5% • **Substance use disorder:** 2.1% • **Insomnia:** 3.1% • **Psychotic disorder:** 0.9%

Rapid Evidence Review Question	Oct 2020 - Original Report	March 2021 – Report Update	June 2021- Current Update (Prioritized Studies Only)
KQ2a) How often do adults without preexisting MH conditions who have been hospitalized for COVID-19 develop new MH symptoms or a new MH diagnosis compared to those with COVID-19 treated only in outpatient settings?	In 1 study of a sample of patients with a low prevalence of preexisting MH conditions, the comparative prevalence of MH conditions during hospitalization were: • **Depression symptoms**: 43.3% (H) vs 34.6% (NH) (1 fair-quality study) • **Anxiety symptoms**: 23.3% (H) 32.7% (NH) (1 fair-quality study) • **MDD**: 3.3% (H) vs 3.8% (NH) (1 fair-quality study) • **GAD**: 6.7% (H) vs 5.8% (NH) (1 fair-quality study) • **Insomnia**: *43.3% (H) vs 21.2% (NH); p=.03* (1 fair-quality study) • **Adjustment disorder**: *26.7% (H) vs 9.6% (NH); p=.042* (1 fair-quality study)	In 3 studies (1 good-quality retrospective cohort & 2 fair-quality cross-sectional) of participants with low, unclear, or no prevalence of preexisting MH conditions, the comparative prevalence of MH conditions was: • **Any psychiatric diagnosis**: Hospitalized pts at higher risk of psychiatric diagnosis than outpatients (HR= 1.4, 95% CI, 1.06-1.85 in 1 good-quality study; prevalence of psychiatric disorders were 60.0% vs 28.8%, p=.006 in 1 fair-quality study) or no differences between groups (1 fair-quality study) • **Depression:** No differences in MDD or depression symptoms between groups (2 fair-quality studies) • **Anxiety:** No differences in GAD or anxiety symptoms between groups (1 fair-quality study) or higher prevalence of anxiety symptoms in outpatients (1 fair-quality study) • **PTSD:** No differences in PTSD symptoms between groups (1 fair-quality study) • **Adjustment disorder**: Higher prevalence of adjustment disorder in hospitalized pts (26.7% vs 9.6%, p=.042) (1 fair quality study) • **Obsessive compulsive**: No differences in obsessive compulsive symptoms between groups (1 fair-quality study) • **Insomnia:** Higher prevalence of insomnia in hospitalized pts (43.3% vs 21.2%, p=.03 in 1 fair-quality study) or no differences between groups (1 fair-quality study)	In 1 good-quality retrospective cohort study, hospitalized patients were at higher risk of receiving the following new MH disorder diagnoses compared to non-hospitalized patients: • **Anxiety disorder:** HR 1.49 [1.34–1.65] • **Mood disorder:** HR 1.53 [1.33–1.75] • **Substance use disorder:** HR 1.68 [1.40–2.01] • **Insomnia:** HR 1.49 [1.28–1.74] • **Psychotic disorder:** HR 2.77 [1.99–3.85]
KQ2b) How often do adults without preexisting MH conditions who have been hospitalized for	No evidence.	No evidence.	No evidence.

Rapid Evidence Review Question	Oct 2020 - Original Report	March 2021 – Report Update	June 2021- Current Update (Prioritized Studies Only)
COVID-19 develop new MH symptoms or a new MH diagnosis compared to adults hospitalized for other causes?			
KQ2c) Does the probability of developing new MH symptoms or diagnosis during or after hospitalization for COVID-19 vary by patient characteristics (*eg*, age, sex, race/ethnicity, comorbidities), COVID-19 disease severity, or level of care?	In 1 fair-quality study of a sample of patients whose preexisting MH conditions were not reported, there was no significant correlation found between post-hospitalization depression symptoms and patient characteristics (gender, age, or comorbidities [hypertension, diabetes, CVD, malignant tumors, liver disease or lung disease]) or COVID-19 disease severity.	Evidence from 5 fair-quality cross-sectional studies of pts with low, unclear, or no prevalence of preexisting MH conditions had mixed results: • **Women** may be at higher risk of developing certain MH symptoms (including anxiety during hospitalization, PTSD after hospitalization, and insomnia during hospitalization) compared to men (2 studies) • **Younger patients** may be at higher risk of developing PTSD symptoms compared to older patients after hospitalization (1 study) • **Severity of COVID-19** may be associated with certain MH symptoms (including anxiety during and after hospitalization, PTSD after hospitalization, and insomnia during hospitalization), but findings on depression symptoms during and after hospitalization are mixed (3 studies) • **Duration of COVID-19** is probably not associated with anxiety or insomnia symptoms during hospitalization, but findings on depression during and after hospitalization are mixed (2 studies) • **Length of hospital stay** is probably not associated with depression or insomnia symptoms during hospitalization or PTSD symptoms after hospitalization, but may be associated with anxiety symptoms during hospitalization (2 studies)	Evidence from 4 fair-quality cross-sectional studies (1 prospective cohort & 3 cross-sectional) of patients with low or unclear rates of preexisting MH disorders indicate **female sex** and **more severe COVID-19** are the two characteristics most consistently associated with worse MH outcomes. There were mixed findings on other pt, disease, and treatment characteristics such as **older age**, **shorter duration of hospitalization** and **receipt of specific treatment such as ventilation and corticosteroids**, with some studies showing an association between these characteristics and worse MH outcomes and others showing no association or an association with better MH outcomes.

Rapid Evidence Review Question	Oct 2020 - Original Report	March 2021 – Report Update	June 2021- Current Update (Prioritized Studies Only)
		• **Receipt of ventilation** was not associated with depression, anxiety, or PTSD symptoms post-discharge, while **receipt of corticosteroids** was associated with worse anxiety symptoms and better PTSD symptoms (1 study)	
KQ3) How often do adults with preexisting MH conditions who have been hospitalized for COVID-19 experience exacerbation of MH symptoms?	No evidence.	1 fair-quality cross-sectional study indicated patients (hospitalized and non-hospitalized) with a previous psychiatric had worse symptoms of anxiety, depression, PTSD, insomnia and obsessive-compulsive disorder post-discharge than those without a psychiatric history.	In 1 fair-quality prospective cohort study, the prevalence of MH symptoms in the 3 months following hospitalization for COVID-19 among those with a MH history were: • **Depression symptoms:** 26% • **PTSD symptoms:** 27% • **Anxiety symptoms:** 50% • **Obsessive-compulsive symptoms:** 39% • **Insomnia symptoms:** 33%
KQ3a) How often do adults with preexisting MH conditions who have been hospitalized for COVID-19 experience exacerbation of MH symptoms compared to those with COVID-19 treated only in outpatient settings?	No evidence.	No evidence.	No evidence.
KQ3b) How often do adults with preexisting MH conditions who have been hospitalized for COVID-19 experience exacerbation of MH symptoms compared to adults hospitalized for other causes?	No evidence.	No evidence.	No evidence.
KQ3c) Does the probability of exacerbating MH symptoms during or	No evidence.	No evidence.	No evidence.

Rapid Evidence Review Question	Oct 2020 - Original Report	March 2021 – Report Update	June 2021- Current Update (Prioritized Studies Only)
after hospitalization for COVID-19 vary by patient characteristics (*eg*, age, sex, race/ethnicity, comorbidities), COVID-19 disease severity, or level of care?			
KQ4) How often and what kinds of MH care do adults access during or after hospitalization for COVID-19?	No evidence.	1 fair-quality retrospective cohort study of 339 hospitalized COVID-19 pts reported that 3 out of 19 readmitted pts had a psychiatric illness as their reason for readmission; however psychiatric diagnoses were present upon initial admission for 2 of these pts. Therefore, COVID-19 is unlikely to be the etiology for these psychiatric episodes. Pts readmitted for psychiatric illness underwent psychiatric evaluation.	One fair-quality prospective cohort study of 892 hospitalized pts found that 89 (10%) required psychiatric consultation. Of note, 23 out of 89 (25%) pts had a prior neuropsychiatric diagnosis. Another fair-quality retrospective cohort study of 339 hospitalized COVID-19 pts reported that 3 out of 19 (16%) readmitted pts had a psychiatric illness as their reason for readmission; however psychiatric diagnoses were present upon initial admission for 2 out of 3 (67%) of these pts.
KQ4a) Does the type or extent of MH care used by adults during or after COVID-19 hospitalization differ compared to before hospitalization?	No evidence.	No evidence.	No evidence.
KQ4b) Does the type or extent of MH care utilization differ for adults hospitalized for COVID-19 compared to adults receiving outpatient treatment for COVID-19?	No evidence.	No evidence.	No evidence.
KQ4c) Does the type or extent of MH care utilization differ for adults hospitalized for COVID-19 compared to adults hospitalized for other	No evidence.	No evidence.	No evidence.

Rapid Evidence Review Question	Oct 2020 - Original Report	March 2021 – Report Update	June 2021- Current Update (Prioritized Studies Only)
causes?			
KQ4d) Does the type or extent of MH care utilization during or after hospitalization for COVID-19 vary by patient characteristics (*eg*, age, sex, race/ethnicity, comorbidities), COVID-19 disease severity, or level of care?	No evidence.	No evidence.	In the fair-quality prospective study of 892 hospitalized patients, the 89 pts who required psychiatric consultation were more likely to require oxygen therapy, consequent ICU transfer, and mechanical ventilation. Pts requiring MH consultation were more likely to have presence of chronic medical disease and/or prior neuropsychiatric diagnosis.
KQ5) What are the MH care resource needs among adults who have been hospitalized for COVID-19?	No evidence.	59% of hospitalized pts report at least some need for psychological guidance in rehabilitation (1 poor-quality cross-sectional study)	59% of hospitalized pts report at least some need for psychological guidance in rehabilitation (1 poor-quality cross-sectional study)

Italics indicates a statistically significant difference between groups at a significance level of .05.
Abbreviations: CVD=Cardiovascular disease; GAD=Generalized Anxiety Disorder; H =Hospitalized; HR= Hazard Ratio; MDD=Major Depressive Disorder; MH=Mental health; NH=Non-hospitalized; Pt=Patient

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