Research Article

Post-Covid Psychological Effects in Adults

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Abstract

Introduction: The COVID-19 pandemic caused significant psychological distress and mental health issues among adults, but a synthesis of evidence on post-COVID psychological effects in adults is lacking. This systematic review summarizes the evidence on psychological effects caused by COVID-19 in adults post-recovery.

Objective: To study post-COVID psychological effects in adults.

Methods: The literature search was done in PubMed, Google Scholar, and Cochrane databases for articles published from January 2020 to September 2021. Search terms used were "COVID-19", "psychological effects", "mental health", and "adults". A systematic approach was used using PRISMA guidelines. Three independent reviewers did study selection and data extraction. The inclusion criteria for review was met by eleven studies. The psychological outcomes assessed were depression, anxiety, chronic fatigue syndrome (CFS), post-traumatic stress disorder (PTSD), and overall mental health status.

Results: The review found high rates of mental health issues among COVID-19 survivors, especially PTSD (33.6%) and CFS (27.3%). Anxiety, depression, and insomnia were reported in 39% of patients. The results highlight the significant psychological impacts of COVID-19 that persist after recovery.

Conclusion: Adults across occupations and regions experienced substantial adverse mental health outcomes like PTSD, chronic fatigue, anxiety, depression, and insomnia after recovering from COVID-19. Further large-scale, geographically diverse studies with longer follow-ups conclusively establish prevalence rates. Identification of at-risk groups and modifiable risk factors can help guide prevention and treatment strategies so as to address the COVID-19 pandemic's mental health fallout.

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Introduction

The global COVID-19 pandemic, caused by the novel virus SARS-CoV-2, has had far-reaching consequences worldwide1. Recent studies estimate that over 50% of COVID-19 survivors experience anxiety, depression, or PTSD symptoms even after recovery (cite stats). While the focus has primarily been on the physical health impact, it is increasingly recognized that COVID has some psychological implications on mental health outcomes as well such as PTSD, anxiety, depression, and overall well-being. Specifically, adults after recovering from COVID-19 may undergo a range of psychological effects that can persist beyond the acute stage of the illness. Understanding both extent & nature of these post-COVID psychological effects is crucial for the development of effective interventions and support systems for affected individuals.

This systematic review intends to provide a comprehensive

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overview of the post-COVID psychological effects in recovered adults. The review will help identify the magnitude of issues like PTSD, anxiety, depression, and poor mental health in this population. It will also inform the development of targeted interventions and mental health services catered to COVID-19 survivors, and highlight gaps to guide future research.

Over the past year, there has been rapid growth in research on post-COVID psychological effects in adults, with several studies examining various aspects of mental health and well-being in this population[2-4]. However, the existing literature remains fragmented, highlighting the need for a comprehensive synthesis of findings to better understand the overall mental health impact of COVID-19 on adults. A systematic review is ideal for aggregating this evidence in a standardized manner and obtaining pooled estimates across studies.

This systematic review aims to bridge this gap by rigorously analyzing existing literature on post-COVID psychological effects in adults. The review includes studies published from January 2020 to September 2021 to ensure up-to-date coverage of the available evidence. We will systematically search electronic databases such as Google Scholar, PubMed, and Cochrane via relevant keywords related to COVID-19, psychological effects, and adults. Additionally, we will manually search reference lists to ensure the inclusion of all relevant studies.

This systematic review will provide a comprehensive overview of post-COVID psychological effects in recovered adults. The review will help identify the magnitude of issues like PTSD, anxiety, depression, and poor mental health in this population. It will also inform the development of targeted interventions and mental health services catered to COVID-19 survivors, and highlight gaps to guide future research. Further research is warranted to conclusively establish the long-term mental health impacts of COVID across diverse populations globally.

Materials And Methods

Study Design

This systematic review was conducted by searching three databases (Google Scholar, PubMed, Cochrane) for articles published from January 2020 to September 2021 using MeSh and Non-Mesh keywords including COVID-19, psychological effects, and adults. The study selection process excluded clinical trials, meta-analyses, perspectives, case series, case reports, and grey literature. The eligibility criteria specified articles focusing on the psychological effects of COVID-19 in adults ages 20-60 years, looking only at post-covid effects. Specific symptoms examined were anxiety, depression, insomnia, stress, and panic attacks. Studies from all global regions were included, without specification of particular professions. After removing duplicates, two authors independently screened titles and abstracts, with three authors reviewing full texts to finalize article selection. Data extraction was done using a standardized form collecting information on study characteristics, demographics, mental health measures, prevalence, and results. A narrative synthesis summarized evidence on psychological outcomes like depression, anxiety, PTSD, chronic fatigue, and overall mental health across studies. Studies assessing the same constructs with standard measures were compared for prevalence rates and pooled estimates were calculated. For differing tools, results were summarized narratively. Evidence tables and figures displayed study details and effect sizes for each primary outcome.

Search Strategy

This systematic review was conducted by searching three databases (Google Scholar, PubMed, and Cochrane). Articles published from January 2020 to September 2021 were searched. MeSH and Non-Mesh keywords like COVID-19, psychological effects, and adults were used. Also, the study selection procedure did not include all clinical trials (RCTS), meta-analyses, case series, perspectives, case reports, and grey literature.

Study Selection

Inclusion criteria: In our review, we selected articles that included the psychological effects of COVID-19 on adults between the ages of 20 and 60 years. The period to study these effects was strictly post-COVID. The symptoms we mainly focused on were anxiety, depression, insomnia, stress, and PTSD. Research articles based on studies all over the world were selected i.e., no region was specified during the study. People from all professions were involved in the study.

Exclusion criteria: Adults less than 20 or more than 60 were excluded. Children were not part of the study. Articles that include psychological effects during COVID-19 weren't included. Articles that include the physical effects of COVID were also excluded.

Screening Process

After removing duplicates, the two authors (H.H., and H.A.) independently checked the titles and abstracts according to the eligibility criteria. The articles selected were subjected to the next phase, and the full text was read by the three authors (H.H, H.M, H.S.R) independently and finalized the arcticles for eligibility. The PRISMA flow diagram in Figure 1 shows the authors' article selection procedure while selecting articles.

We searched three databases (Google Scholar, PubMed, and Cochrane Library) and identified 100 articles. After identification and screening, we were left with 11 articles that were included in the systematic review. The details of the search process are given in the PRISMA flowchart shown in Figure 1. This review was not registered on PROSPERO.

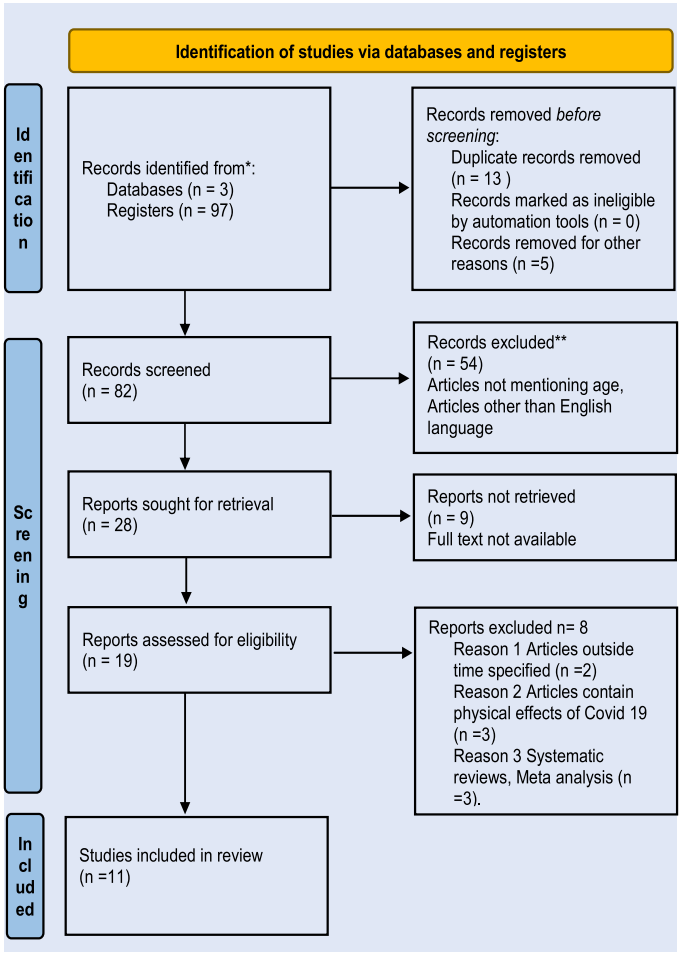

Figure 1: *PRISMA Flow Diagram for study selection*

Data Extraction

Three authors (H.H, H.M, and H.S.R) extracted data from the remaining 11 articles that were included in the review. The summary table contains information on authors, titles, publication dates, study design, sample size, age, and population group. More specifically the data about mental health effects, tools to measure mental health, sex differences, mental health effects, and possible risk factors.

Results:

After extraction of data, we found that most of the studies found PTSD, anxiety, and depression. Other symptoms like CFS/ME, obsessive-compulsive disorder, anger, etc. were found in only one study. A forest plot was plotted to observe prevalence of these effects in different studies. Table 1 summarizes the key characteristics and findings of the 11 studies which were included in the review.

The review turned out to have high rates of mental health issues among COVID-19 survivors, especially PTSD (33.6%) and CFS (27.3%). Anxiety, depression, and insomnia were reported in 39% of patients. The results highlight the significant psychological impacts of COVID-19 that persist after recovery. Figure 2 shows the prevalence of different psychological effects reported across the reviewed studies.

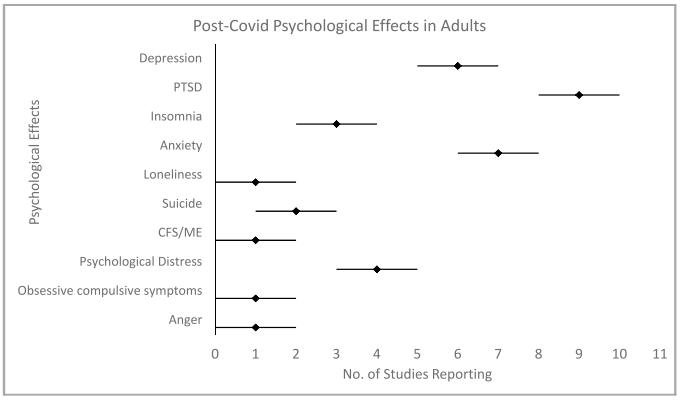

Figure 2: *Prevalence of Psychological Effects in Reviewed Studies: The Forest Plot*

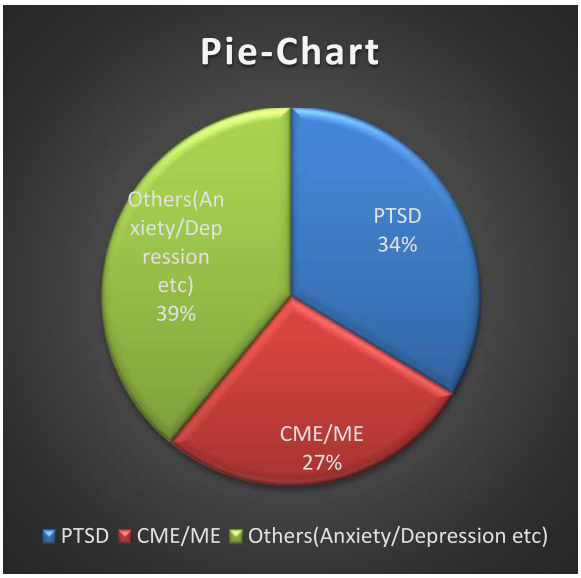

Figure 3: *Post-Covid psychological effects in adults*

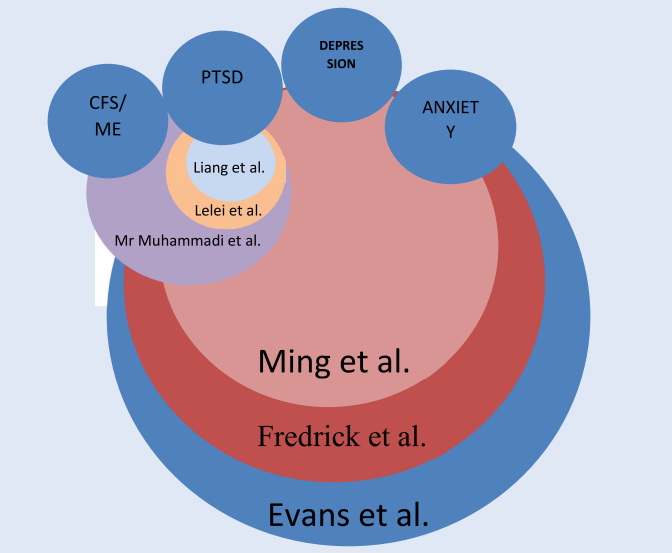

Figure 4: *Venn Diagram representing of co-occurrence of various effects*

Table 1: *Summary of Included Studies*

Sr. No.	Study Age	Mental Health Effects	Tools to Measure Mental Health	Sex Difference	Mental Health Outcomes
1.	Evans et al. 2021 40-59 years	Anxiety, PTSD & depression	1. (GAD-7) General Anxiety Disorder 7-item scale 2.(PHQ-9) The Patient Health Questionnaire-9 3. (PCL-5) The PTSD Checklist for DSM-5 4.A short physical performance battery and (MoCA) the Montreal Cognitive As used to test minor cognitive imp evaluate the lower extremities' function.	not significant	The PHOSP-COVID study found that COVID-19 survivors experienced a range of mental health issues, including depression, anxiety, and post-traumatic stress disorder (PTSD).
2.	Pistarini et al. 2021 64.13 years	Patients with COVID-19 exhibit signs of post-traumatic stress disorder (PTSD), discomfort, anxiety, and sadness. In addition to loneliness, rage, anxiety, sadness, insomnia, PTSD, and stigma, patients with COVID-19 may additionally experience.	MoCA is a Mini-Mental State Examination (MMSE). The MoCA is a quick screening tool for moderate cognitive impairment, whereas MMSE is a regularly used test for detecting cognitive impairment.	nil	Studies posttraumatic stress symptoms and attitude toward crisis mental health services among clinically stable COVID-19 patients in China
3.	Pistarini et al. 2021 various age groups	PTSD, depression, anxiety, obsessive-compulsive symptoms, and insomnia	not mentioned	nil	Management of psychiatric, neurological, and medical conditions may reduce suicide risk among COVID-19 survivors
4.	Frederick et al. 2021 various age groups	The article discusses a range of potential mental health outcomes of the COVID-19 outbreak, including anxiety, PTSD, substance abuse, depression, and suicide. The authors also highlight the potential long-term consequences of the pandemic on mental health.	The study does not discuss specific tools to measure mental health, but it does reference several studies that have used validated measures to assess mental health outcomes.	The article briefly mentions that women have higher levels of anxiety and depression than men.	The article discusses a range of potential mental health outcomes of the COVID-19 outbreak, including increased rates of anxiety, depression, PTSD, substance abuse, and suicide. The authors also highlight the potential long-term mental health consequences of the pandemic such as increased rates of chronic mental health conditions.

5.	M. R. Mohammadi et al. 2021 18-65 years,	The study investigated the prevalence of chronic fatigue syndrome and post-traumatic stress disorder among COVID survivors.	Posttraumatic Stress Disorder Checklist for DSM-5 (PCL-5) and the Chalder Fatigue Scale (CFQ) were used to assess the mental health outcomes of the participants.	Female predominance was seen to be associated with an increased risk of chronic fatigue syndr myalgic encephalomyelitis (CFS/ME) among COVID-19 survivors.	According to the study, 33.6% and 27.3% of COVID-19 survivors had post-traumatic stress disorder (PTSD) and chronic fatigue syndrome/myalgic encephalomyelitis (CFS/ME), respectively.
6.	Ming-Yu Si et al. 2021 18 years or older.	Post-traumatic stress disorder (PTSD), depression, tension, and anxiety.	1.The Impact of Event Scale-Revised (IES-R), 2. The Patient Health Questionnaire-9 (PHQ-9) 3.The Generalized Anxiety Disorder -7 (GAD-7) 4.The Perceived Stress Scale-10 (PSS-10) 5.The World Health Organization Quality of Life-BREF (WHOQOL-BREF) were all used in the study to assess mental health outcomes.	Not significant	The primary outcome of the study is the change in mental health status from baseline to 4 weeks after the intervention, as measured by the IES-R. Secondary outcomes include changes in anxiety, depression, stress, PTSD, & quality of life
7.	Khan et al. 2021 18 years and above	The study aimed to investigate the influence of government strategies, social distancing, psychological distress, and emotional recovery on quality of life during the COVID 19 outbreak.	To rate the items, the researchers utilized a five-point Likert scale with a range of 1 (strongly disagree) to 5 (strongly agree). Depression, anxiety, and somatization are three characteristics used to quantify psychological discomfort. The other criteria are assessed in accordance with Meijer et al. (2011), Li and Ahlstrom (2016), and Whoqol (1995), respectively. These parameters include psychological distress, emotional recovery, and quality of life.	The majority of the respondents were male (71 per cent).	The article found that psychological distress hurt the quality of life during outbreak of the COVID-19. Emotional recovery was seen to moderate the relationship between psychological distress and quality of life. Government strategies and social distancing were found to have a direct influence on quality of life.
8.	Leilei Liang et al. 2020 four age groups: 14-20, 21-30, 31-35, and over 35.	PTSD symptoms, psychological distress, depression, and anxiety.	The General Health Questionnaire Scale (GHQ-12) was the tool used to measure mental health in this study. Additionally, the Civilian Version (PCL-C) was employed to gauge post-traumatic stress symptoms related to COVID-19.	NIL	The study shows that 14.4% of the youth groups exhibited PTSD symptoms, and about 40.4% of the participants reported having psychological issues.

9.	Idowu et al. 2020 15 and 40 years.	The COVID-19 had noteworthy impact on Nigerian students' mental health. Students who reported need for substance use as a coping mechanism and those who were dissatisfied with online education techniques had significantly higher odds of poor mental wellness.	The study suggests that mental health may mediate the effects of COVID-19-related self-stigma and PTSD on quality of life and insomnia. The study also concludes that mental health concerns should be considered in intervention or preventive measures when helping COVID-19 patients to decrease potential negative consequences of the disease, especially on their HRQoL and sleep	Not mentioned	The study found that COVID-19 had huge impacts on mental health of Nigerian students. The odds of decreased mental well-being were significantly higher in students who indicated a need for substance use as a coping strategy and those who were not satisfied with online teaching methods. The study suggests that the post-COVID-19 national reconstruction initiatives should emphasize and take into account the psychological health of Nigerian students.
10.	Liang et al. 2020 14 to 35yeas	The study aimed to assess the mental state of youngsters diagnosed with PTSD due to the COVID-19 outbreak in China. The study found that 12.8% of respondents were diagnosed with PTSD, which indicates the importance of the public health emergency.	The study used the General Health Questionnaire-12 (GHQ-12) to examine general psychopathology	In some studies, PTSD symptoms are more prevalent in women than in men, but in other studies, PTSD diagnoses are more common in men.	According to study, 12.8% of participants were diagnosed with PTSD indicating the significance of the public health emergency. The study also found that general mental health can be affected by PTSD through NCS, highlighting the moderating effect of gender on this association.
11.	Mahmoudi et al. 2021 mean age=45.91 years	The study suggests that mental health may mediate the effects of COVID-19-related self-stigma and PTSD on quality of life and insomnia. It also concludes that mental health concerns should be considered in preventive measures when helping COVID-19 patients to decrease the complication of the disease.	The study used the Mental Health Inventory-5 (MHI-5) for assessing mental health. Higher MHI-5 scores indicate better mental health.	The study reports that approximately two-thirds of the participants were male	The findings imply that PTSD and self-stigma associated to COVID-19 may have a mediating effect on quality of life and insomnia.

Discussion

Covid-19 pandemic was caused by SARS-COVID world-wide. It has caused various physical and psychological effects in adults. Young people faced more problems in coping and adapting to the changed social atmosphere in the wake of the pandemic as compared to older adults who have far more developed coping abilities[5]. Post-traumatic stress disorder

(PTSD), anxiety, depression and chronic fatigue syndrome/ myalgic encephalomyelitis (CFS/ME) were common. Patients with COVID-19 had also experienced loneliness, anger, insomnia, suicide and obsessive compulsive disorder,and stigma[6-9].

The review found high rates of PTSD (33.6%), CFS (27.3%), and anxiety/depression (39%) among COVID-19 bearers based on pooled estimates across the included studies. Studies found that among 40.4% of people who participated in the study, 14.4% of youth had psychological effects after COVID outbreak[10-16].

Government strategies like lockdowns, and social distancing were found to have a direct impact on quality of life. Moreover, it was seen during the lockdown period that people were suffering more from psychological effects like fear, stress, and anxiety. These psychological effects were reduced after the lockdown period[17]. Among adults, psychological effects were more common among students who were more satisfied with physical rather than online education. HCWs especially postgraduate trainees, are more liable to be suffered from depression, anxiety and stress disorders[18].

It has been found that large number of healthcare workers experienced symptoms of anxiety, depression, acute stress disorder, and insomnia[19]. PCS includes fatigue, anxiety, depression, and insomnia. Patients were presented with neurological complications like headache, cognitive impairment, brain fog, insomnia, and personality disorder[20].

Post-traumatic stress disorder and chronic fatigue syndrome were most common in people after COVID-19. Although these were not our main focus, we found PTSD and CFS as new findings in our research. Stats show that these two effects were more prevalent among individuals after COVID.

Latest studies which were conducted after one year of COVID-19 proved that mental health effects were linked to frailty. Participants who have recovered from COVID-19 with higher levels of frailty have more symptoms of anxiety and depression after one year of hospitalization[21].

For the treatment of these effects so that the adults overcome these disorders, rehabilitation and counseling are necessary. Proper counseling of adults will help them to recover from these effects and lead healthy and normal lives. For adults who are suffering from depression, drugs like anti-depressants can be given.

Conclusion

The COVID-19 pandemic has caused psychological effects in persons who have recovered from COVID-19 or who haven't suffered from COVID-19. Persons from every department in every area suffered from these effects. These effects were depression, anxiety, chronic fatigue syndrome, and post-traumatic stress disorder.

In summary, this review found that mental health issues like PTSD, chronic fatigue, anxiety, and depression were commonly reported in adults recovering from COVID-19, with pooled prevalence estimates of 27-39% for these outcomes based on the current evidence. We also found that frailty is directly associated with depression.

Continued research is needed to fill in a lot of gaps in our knowledge of this subject without specifying any geographical area and population. More research should be conducted where COVID-19 patients were more in countries like India, Germany, China, and Russia.

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