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Prevalence of Mental Health Conditions and Brain Fog in people with long COVID.

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Abstract Body

Background: Persisting illness $\geq$ 12 weeks after acute SARS-CoV-2 infection ('long COVID') can include elements of impaired cognition commonly referred to as 'brain fog' (a term encompassing a range of symptoms) and mental health conditions. We performed a systematic review and meta-analysis to estimate their prevalence and to explore factors relevant to their manifestation.
Methods: Data were extracted from studies published in Medline and PsycINFO (Searches:January 2022-August 2023) which reported prevalence of mental health conditions and brain fog in adults with long COVIDafter clinically-diagnosed or PCR-confirmed SARS-CoV-2 infection. PROSPERO registration:CRD42023394105. **Findings:** Of 7,451 studies identified, 17 were included, reporting 41,249 long COVID patients. Risk-of-bias was deemed low-moderate. Twelve studies (n=4,609) reported participant sex: females=2,660 (58%). Across an aggregate of all timepoints (3-24

months) and all studies taken together, the combined prevalence of mental health conditions and brain fog was 20·4% (95% CI 11·1%-34·4%), being lower amongst those previously hospitalised than in community-managed patients (19·5 vs 29·7% respectively; p=0·047). A subset of studies reporting cognitive symptoms suggested a brain fog prevalence rate of 23·3%. Meta-regression analysis revealed the odds of mental health conditions and brain fog increased over time and when validated instruments for diagnostic assessment were used. This was more marked for brain fog than for mental health conditions. Odds of brain fog, but not of mental health conditions, significantly decreased with increasing vaccination rates (p=·000). **Interpretation:** Brain fog may have different drivers than mental health conditions in long COVID. The reduced risk of brain fog associated with vaccination emphasizes the need for ongoing vaccination programs. Given the increasing prevalence of mental health conditions and brain fog over time, preventive treatments may be needed. Study limitations include a lack of healthy matched controls and of information regarding medical history. Our findings emphasize the need to provide access to integrated care to manage mental health conditions and brain fog in long COVID. **Funding:** NIHR (COV-LT2-0043) as part of the STIMULATE-ICP study.

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Study Type
Systematic review/Meta analysis

Clinical Conditions and Disorders
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Psychological profiles

Learning Objective 1
Information on prevalence of long COVID.

Learning Objective 2
Information on prevalence of brain fog and mental health conditions in long COVID.

Learning Objective 3
Information on factors associated with their manifestation.

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The paper was written by authors of a variety of ethnic backgrounds and gender and addresses a problem where inequity in access to care is a public health concern.