

Psychological Distress, Persistent Physical Symptoms, and Perceived Recovery After COVID-19 Illness



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INTRODUCTION

Many patients hospitalized for COVID-19 report physical and psychological symptoms that persist for months after viral clearance—the so-called “long-haulers”.¹ Symptom persistence is not only limited to those with severe forms of COVID-19, but also often occurs in patients with mild-to-moderate illness not requiring intensive care or prolonged hospitalization.^{2,3} COVID-19 can also result in symptoms of depression, anxiety, and/or posttraumatic stress disorder (PTSD), which may interfere with subsequent physical recovery.⁴ In this study, we examined the association of depression and PTSD with perceived recovery following COVID-19 illness.

METHODS

Adults hospitalized for COVID-19 at two Columbia University hospitals and discharged home between March 26 and May 27, 2020 were invited to complete a 3-month post-discharge survey assessing the physical and psychological impact of their COVID-19 illness. Surveys could be completed in English or Spanish via telephone or online. Survey questions included demographics (age, sex, race, ethnicity), history of mental illness (depression, anxiety, PTSD), and the presence of nine common COVID-19 physical symptoms both during and after hospitalization. PTSD was assessed using the PTSD Checklist for DSM-5, with questions asked in reference to the COVID-19 illness (PCL-5, scores ≥ 30 considered positive). Depression was assessed using the 8-item Patient Health Questionnaire (PHQ-8, scores ≥ 10 considered positive). COVID-19 recovery was determined by asking “Overall, how much have you recovered to your usual state before having COVID-19?” (0—*not at all*, 1—*a little*, 2—*mostly*, 3—*fully*). Responses were coded “1” for fully recovered and “0” otherwise. Length of stay, level of inpatient care, and intubation during the COVID-19 hospitalization were obtained from the medical record. Logistic regression was used

to estimate the association of COVID-related PTSD and depression with perceptions of recovery, adjusting for covariates. Analyses were performed using SAS statistical software (v9.4, SAS Institute) at a two-sided alpha of 0.05. The Columbia University Institutional Review Board approved the study, and all patients provided informed consent.

RESULTS

Of 510 eligible patients, 153 completed the survey (58 by telephone, 95 online, median 3.7 [range 2.6–5.7] months post-discharge). Mean age was 54.5 ± 16.7 years, 39.9% were female, 17.0% were White, 15.0% were Black, 54.9% were Hispanic, and 15.0% reported a history of mental illness (13.1% depression, 8.5% anxiety, 2.6% PTSD, 2.0% other). The mean length of COVID-19 hospitalization was 8.0 ± 8.1 days, 5.9% of patients required ICU admission, and 4.6% were intubated. Only 35.5% of patients reported full recovery from their COVID-19 illness, 23.5% had COVID-related PTSD, 18.3% had depression, and 12.4% met the criteria for both.

The most common persistent COVID-related physical symptoms were body aches (23.5%), fatigue (20.3%), shortness of breath (19.0%), and headaches (13.1%), each of which was more likely to be reported by patients with depression or PTSD (Fig. 1). Depression and PTSD were each associated with a greater mean number of persistent physical symptoms (depression: 2.46 vs. 0.73, $p < 0.001$; PTSD: 2.08 vs. 0.69, $p < 0.001$) and a higher likelihood of feeling unrecovered (depression: 85.7% vs. 60.5%, OR 3.92, 95% CI 1.28–11.99, $p = 0.02$; PTSD: 91.7% vs. 56.5%, OR 8.46, 95% CI 2.45–29.18, $p < 0.001$). In the fully adjusted model, this association became non-significant for depression (OR 3.12, 95% CI 0.51–19.12, $p = 0.22$) but remained borderline significant for PTSD (OR 4.93, 95% CI 0.86–28.37, $p = 0.07$; Table 1).

DISCUSSION

Patients with COVID-related PTSD and depression had a higher burden of persistent physical symptoms and were less likely to feel fully recovered 3 months after their COVID-19 illness. PTSD and depression have been associated with interoceptive dysfunction, which may perpetuate physical symptoms long after the acute illness has resolved.^{5,6} Therefore, one interpretation of our findings is that patients with PTSD and/or depression are more sensitive to physical symptoms,

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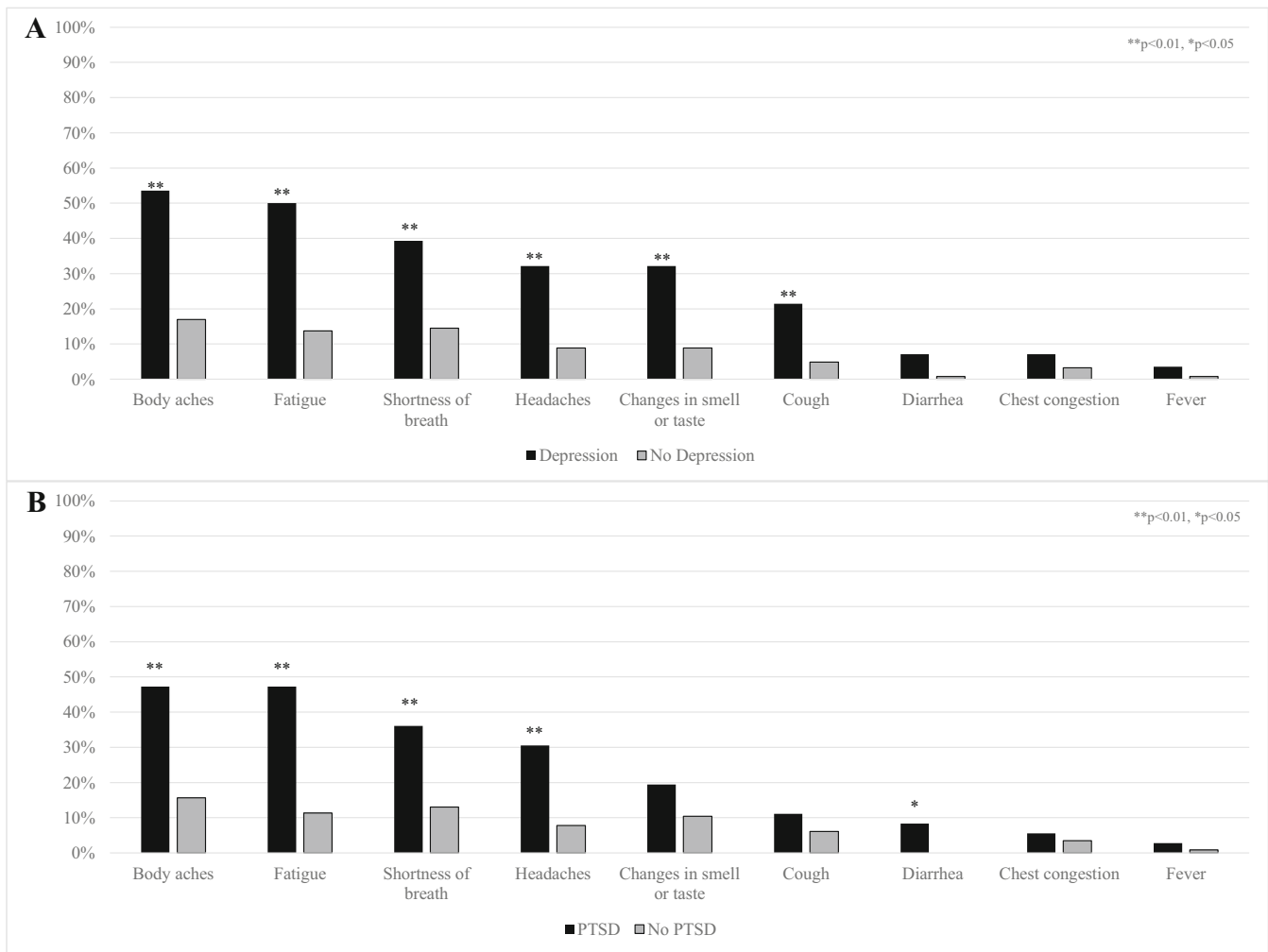


Figure 1 Prevalence of persistent COVID-related physical symptoms 3 months after COVID-19 hospitalization according to **A.** depression status (PHQ-8 score ≥ 10 vs. PHQ-8 score < 10) and **B.** PTSD status (PCL-5 score ≥ 30 vs. PCL-5 score < 30); $n = 153$.

experience heightened psychological distress in response, and consequently feel less recovered from their COVID-19 illness.

Study limitations included single-center recruitment from a predominantly hospitalized, urban, Hispanic population,

thereby reducing generalizability; modest sample size with limited power to detect clinically meaningful differences; and low survey completion rates subject to potential response

Table 1 Association of Patient Demographic and Clinical Variables with Perceptions of Recovery Following COVID-19 Hospitalization ($n = 153$)

Characteristic	Unadjusted OR [¶]	95% CI	<i>p</i> -value	Adjusted OR [#]	95% CI	<i>p</i> -value
Age (per 1-year increase)	0.99	0.97–1.02	0.61	1.00	0.97–1.04	0.86
Female (vs. male)	1.33	0.67–2.65	0.42	0.69	0.23–2.07	0.51
Black (vs. non-Black)	2.18	0.76–6.24	0.15	3.46	0.61–19.68	0.16
Hispanic (vs. non-Hispanic)	0.68	0.35–1.33	0.26	0.93	0.29–2.95	0.90
Length of hospitalization [*]	1.03	0.97–1.09	0.35	0.99	0.93–1.07	0.86
Self-reported mental illness [†] (vs. none)	1.31	0.50–3.42	0.59	0.85	0.18–3.92	0.83
Depression [‡]	3.92	1.28–11.99	0.02	3.12	0.51–19.12	0.22
COVID-induced PTSD [§]	8.46	2.45–29.18	< 0.001	4.93	0.86–28.37	0.07
Persistent physical symptoms	2.72	1.65–4.46	< 0.001	4.37	1.79–10.65	0.001

Abbreviations: PTSD, posttraumatic stress disorder; PHQ-8, Patient Health Questionnaire (8-item); PCL-5, PTSD Checklist for DSM-5

^{*}Days hospitalized for COVID-19 illness

[†]Depression, anxiety, PTSD, and/or other

[‡]PHQ-8 score ≥ 10 vs. PHQ-8 score < 10

[§]PCL-5 score ≥ 30 vs. PCL-5 score < 30

^{||}Sum of persistent COVID-19 physical symptoms (range 0–9)

[¶]Bivariate analyses examining the unadjusted associations between each of the listed variables and perceived COVID-19 recovery

[#]Logistic regression model including all listed variables to estimate their adjusted associations with perceived COVID-19 recovery

bias. Nevertheless, our estimates of symptom persistence are consistent with prior studies.²

Notwithstanding these limitations, this is the first study to examine the association between psychological distress and COVID-19 recovery. Our findings highlight the importance of mental health screening in the management of post-acute COVID-19. Furthermore, they suggest that addressing depression and PTSD may be needed to optimize psychological and physical recovery from COVID-19.

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Author Contributions IMK conceived and designed the study; supervised the study protocol, participant recruitment, and data collection; and obtained research funding. NM and MW provided advice on study design and methodology. TC provided advice on statistical analysis. AT and JES helped to coordinate the study and curate the collected data. NAL contributed to the study design, analyzed the data, and drafted the manuscript. All authors

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Declarations:

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