Persistent work limitations in Long COVID: A cross-sectional analysis of employed US respondents to the 2022 National Health and Wellness Survey

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Introduction

- An estimated 6% of adults in the United States (US) are currently experiencing persistent symptoms after SARS-CoV-2 infection ("Long COVID").[1]
- Long COVID has recently been linked with unemployment and reduced work hours among US workers, suggesting impacts to the workforce and economy.[2]
- Whether and how much short-term absences (absenteeism) and reduced productivity while working (presenteeism) might contribute to these impacts has not been studied.

Objectives

To examine work productivity loss among US adults who reported physician-identified Long COVID.

Methods

Data Source

Data were obtained from US respondents to the 2022 National Health and Wellness Survey (NHWS). The NHWS is a self-administered, online questionnaire completed each year by a sample of adults (~75,000) who are representative of the US general population, relative to age, sex, and race/ethnicity.[3] Respondents are recruited through a web-based consumer panel (non-health specific) via opt-in e-mails, co-registration with panel partners, e-newsletter campaigns, banner placements, and affiliate networks.

Sample

- Adults who met the following eligibility criteria were included in the analysis:
  - Employed at the time of survey.
  - Had experienced COVID in the past (date unspecified) and said their physician had identified them as having had Long COVID or COVID syndrome.
  - Experiencing Long COVID symptoms at the time of survey.
- Respondents were stratified by their magnitude of activity limitations reported on the Work Productivity and Activity Impairment questionnaire (WPAI)* to differentiate and compare those who reported the greatest vs. least impacts of Long COVID.

Measures

Sociodemographic and health characteristics

Sociodemographic and health characteristics were used to describe the individual disease cohorts. Mental health was evaluated with two validated instruments:

- GAD-7[5]: The General Anxiety Disorder questionnaire evaluates the magnitude of anxiety severity (score range 0-21). Clinical impairment is indicated as: None/Mild (<10), Moderate (10-14), Severe (≥15).
- PHQ-9[6]: The Patient Health (9-item) questionnaire evaluates the magnitude of depression severity (score range 0-27). Clinical Impairment is indicated as: None/Mild (<10), Moderate (10-14), Moderately Severe (15-19), and Severe (≥20).

Work productivity impairment

Work productivity impairment was evaluated using the WPAI, which derives three scores corresponding to the percent of time that was impacted by ones' health:

- Presenteeism: Productivity loss due to illness while working.
- Absenteeism: Productivity loss related to sick leave / absences from work.
- Overall Work Impairment: sum of presenteeism and absenteeism.

Analysis

Respondents in the lowest vs. highest tertiles of WPAI-derived activity impairment were compared using Bonferroni-adjusted pairwise comparisons. Results were summarized using descriptive statistics (means and standard deviations or frequency counts and percentages, as appropriate).

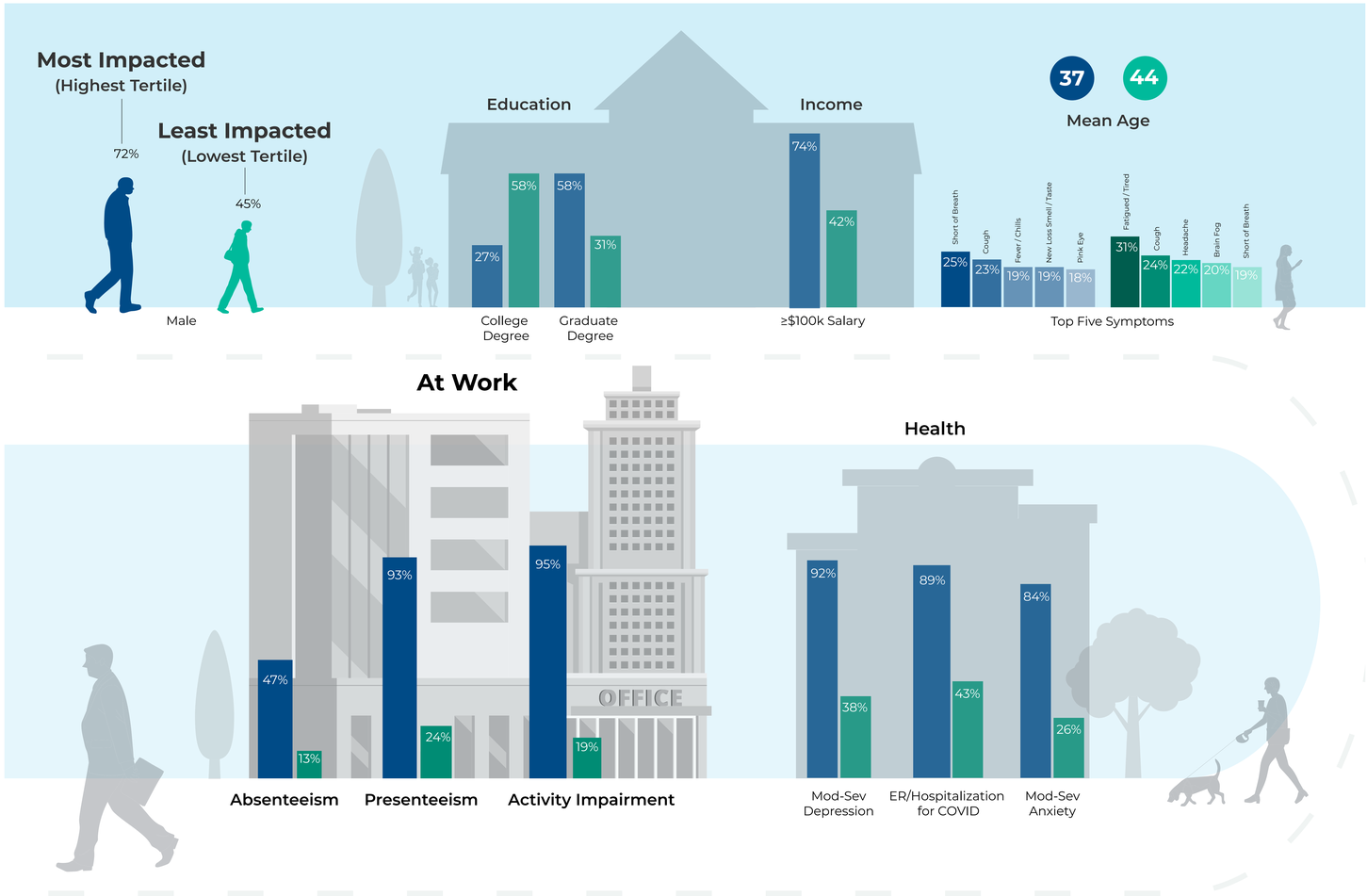
Results

Demographic and Health Characteristics (Table 1 & 2)

- Of the N=595 eligible respondents, 58.5% were male with a mean (SD) age of 40.3 years. The majority had attained a college or graduate education (86.6%), and many reported an annual income of ≥$100k (58.5%) (Table 1).
- HT respondents were twice as likely to report having visited the ER due to COVID. They also had a Charlson Comorbidity Index (CCI)[7] three-times greater than LT respondents' (p's<.001).
- The most frequent Long COVID symptoms reported at time of survey included (but was not limited to) cough, fatigue, shortness of breath, brain fog, and headache (Table 2). Symptoms which differentiated HT from LT included (but was not limited to) cyanosis, fever or chills, persistent pain/pressure in chest, pink eye, and inability to wake/stay awake (p's<.05) (Table 2).

Work Productivity Impacts (Table 3)

- Among HT respondents, the frequency of absenteeism and presenteeism was almost four times that among LT respondents (all p<.001).
- Almost all HT respondents reported a reduction in overall work productivity of 50% or more versus a minority of LT respondents (<30%).



Conclusions

- Adults with Long COVID exhibit substantial work limitations, with those most impacted (HT) reporting a 50% overall loss of productivity, and roughly half of those least impacted (LT) reporting >25% overall loss.
- Severity of SARS-CoV-2 infection and concurrent health problems appeared to correlate with increased workplace impairment, highlighting a need for further work exploring the predictors and consequences of Long COVID-related work impairments, limitations, and disability.

Table 1

Sociodemographic and health characteristics

		Lowest Tertile (n=291)		Highest Tertile (n=304)		P
		Mean (%)	SD/N	Mean (%)	SD/N	
Age (in years), mean (SD)		43.5	13.7	37.2	8.4	<.001
Sex (Male)		44.7	130	71.7	218	.000
Educational Attainment	Less than high school/decline to answer	2.4	7	4.0	12	<.001
	High school education	8.9	26	11.5	35	
	College education	57.7	168	26.6	81	
	Graduate education	30.9	90	57.9	176	
Annual Household Income	<$50K/decline to answer	23.0	67	7.2	22	
	$50-99K	34.7	101	18.8	57	
	$100-150K	25.1	73	41.8	127	
	>$150K	17.2	50	32.2	98	
GAD-7	None/minimal	45.0	131	5.6	17	.000
	Mild anxiety	28.9	84	10.2	31	
	Moderate anxiety	17.2	50	43.4	132	
	Severe anxiety	8.9	26	40.8	124	
PHQ-9	None/minimal	37.5	109	4.3	13	
	Mild depression	24.7	72	3.3	10	
	Moderate depression	16.2	47	23.4	71	
	Moderately severe depression	15.8	46	29.9	91	
	Severe depression	5.8	17	39.1	119	
Charlson comorbidity Index, mean (SD)		.5	1.3	1.7	3.0	
Received emergency care/hospitalization for COVID in the past*		42.6	124	89.1	271	

* Emergency care / hospitalizations are an indicator of the severity of SARS-CoV-2 infection. Note, we did not differentiate between visits received during acute vs. post-acute phases of infection (thus, visits may be associated with either acute or Long COVID).

Table 2

Long COVID symptoms that differ between HT and LT cohorts

	Lowest Tertile		Highest Tertile		P
	Mean (%)	SD/N	Mean (%)	SD/N	
Pale, gray, or blue colored skin, lips, or nail beds**	6.2	18	15.5	47	<.001
Fever or chills	11.0	32	19.1	58	.006*
Persistent pain or pressure in the chest	9.3	27	16.5	50	.009*
Pink eye	6.2	18	17.8	54	<.001*
Fatigue/tired	31.3	91	15.1	46	
Inability to wake or stay awake	3.8	11	12.8	39	
Headache	21.7	63	11.2	34	
Dizziness/lightheadedness on standing	9.6	28	4.9	15	.027*
Anxiety/depression	15.1	44	6.6	20	<.001*
Memory loss	11.7	34	4.3	13	
General pain/discomfort	8.3	24	4.3	13	.045*

* Reported among respondents who were currently experiencing symptoms at time of survey.
** Indicative of cyanosis

Table 3

Work and activity limitations

		Lowest Tertile		Highest Tertile		P
		Mean (%)	SD/N	Mean (%)	SD/N	
WPAI (% time impacted)	Absenteeism	12.7	21.5	47.3	23.6	.000
	Presenteeism	24.2	23.6	92.8	11.1	
	Overall productivity loss	31.2	28.1	95.4	8.7	
	Activity impairment	18.7	15.0	95.2	5.0	
Magnitude of overall productivity loss	<25% time impacted	50.2	143	0.4	1	.000
	25-49% time impacted	23.2	66	0.0	0	
	50-74% time impacted	16.8	48	2.4	7	
	75-100% time impacted	9.8	28	97.2	282	

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