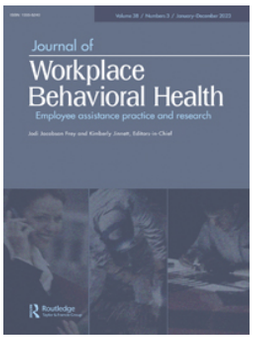

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RESEARCH ARTICLE

Association between reasons for not working and reporting of major depression and anxiety symptoms among U.S. adult population during the COVID-19 pandemic

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ABSTRACT

COVID-19 continues to take a large toll on the mental health of the not working population, particularly of those who were unable to work. This study, using the Household Pulse Survey, estimated the association between reasons for not working and major depression and anxiety symptoms (MDAS). The lowest MDAS was reported by retirees. Individuals who were unable to work because of transportation problems, layoffs, COVID-19 concerns, and sickness or disability reported the highest MDAS. Mediation analysis showed that the direct and indirect effects of reasons for not working were much higher for those individuals who were unable to work than for individuals who were working or decided not to work.

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KEYWORDS
COVID-19; depression and anxiety; mental health; not working; reasons for not working; U.S. Household Pulse Survey

Introduction

The coronavirus disease 2019 (COVID-19) continues to take a large toll on the mental health status of the population in several countries (Czeisler et al., 2020; Fancourt, Steptoe, & Bu, 2021; Grose, 2020; Liu, Zhang, Wong, Hyun, & Hahm, 2020; Nagata, Ganson, Bonin, et al., 2022; Panchal, Kamal, Cox, & Garfield, 2021; Rajkumar, 2020; Steptoe & Di Gessa, 2021; Vahratian, Blumberg, Terlizzi, & Schiller, 2021). The prevalence of psychological distress among U.S. adults increased by more than 360% in 2020 compared with 2019 (Zhang, Walkover, & Wu, 2021). The percentage of adults who reported serious psychological distress increased by more than threefold in April 2020 compared with April 2018 (McGinty, Presskreischer, Anderson, Han, & Barry, 2020). From April 15 through 20, 2020, a threefold increase in depression was reported among U.S. adults compared with before the COVID-19 pandemic (Ettman et al., 2020). In May 2020, the positive screenings for depression, anxiety, or either was

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35.9%, increasing to 40.9% in July 2020 ($p < 0.001$) (Cai, Woolhandler, Himmelstein, & Gaffney, 2021).

The mental health impact of the pandemic was particularly high for not working individuals who might face additional exposures to mental health problems (Caparros-Gonzalez & Alderdice, 2020; Ceulemans, Hompes, & Foulon, 2020; Druss, 2020; Holmes et al., 2020; Liu et al., 2020; Pfefferbaum & North, 2020). The literature consistently indicates that not working individuals, in general, and the unemployed and job insecure individuals, in particular, are exposed to many stressors including reduced income (Brand, 2015; Burgard, Brand, & House, 2007; Hammarström & Janlert, 2002; Montgomery, Cook, Bartley, & Wadsworth, 1999; Mossakowski, 2009; Price, Choi, & Vinokur, 2002; Ruffolo, Price, Bonsaksen, et al., 2021; Thomas, Benzeval, & Stansfeld, 2005; Viinamäki, Koskela, & Niskanen, 1996; Wilson et al., 2020), loss of health insurance (Banthin, Simpson, Buettgens, Blumberg, & Wang, 2020; Blumenthal, Fowler, Abrams, & Collins, 2020; Gangopadhyaya & Garrett, 2020), low self-esteem (Brand, 2015; Price et al., 2002), social isolation, and emotional loneliness (M. Ruffolo, Price, Bonsaksen, et al., 2021) that might negatively affect their mental health (Blanchflower & Bryson, 2021; Fryer & Payne, 1986; Ganson, Tsai, Weiser, Benabou, & Nagata, 2021; Hartley & Fryer, 1984; Murphy & Athanasou, 1999; O'Brien, 1986; Ruffolo, Price, Bonsaksen, et al., 2021; Warr, 1987).

Individuals might not work for different reasons. Considering the not working population as one homogenous group might camouflage demographic, economic, and psychosocial differences among this population that might experience different mental health sequalae. The negative impact of not working on mental health might vary within the not working population by age (Blanchflower, 2020; Blanchflower & Bryson, 2021), race and ethnicity (Blanchflower, 2020; Goldmann et al., 2021), marital status (Blanchflower & Bryson, 2021; Chen, Aruldass, & Cardinal, 2022), education (Blanchflower & Bryson, 2021; Cai et al., 2021), family income (Holingue et al., 2020; McGinty et al., 2020), access to health insurance (Nguyen, 2021), social network, region or state (Donnelly & Farina, 2021). In this study, I focused on the association between reasons for not working and major depression and anxiety symptoms (MDAS) during the pandemic. To our knowledge, no previous studies have investigated the relationship between reasons for not working and mental health symptoms, specifically major depression and anxiety symptoms, using nationally representative data. This issue has become even more important during the COVID-19 pandemic because, in addition to the reasons that were prevalent before the pandemic, individuals might not work due to fear of getting the virus (U.S. Bureau of Labor Statistics, 2022). Shortages of child and

elder care were also exacerbated during the pandemic. In this study, using nationally representative data, I examined whether reasons for not working were associated with the MDAS of not working individuals. This study provides much needed insight to identify individuals with higher risk of MDAS among the not working population during the pandemic.

This study had two objectives. The first objective was to examine whether not working individuals were at excess risk of mental health problems compared with working individuals, and if just comparing working and not working individuals might underestimate the negative effect of not working on specific subgroups of the not working population. The second objective was to examine to what extent different reasons for not working were associated with MDAS, exploring the channels through which these reasons for not working might affect the mental health of the not working population. I hypothesized that the deleterious effect of not working on the mental health of individuals would be more severe for those who were unable to work rather than for retired individuals or for individuals who decided not to work because of personal and family reasons. The results of this study could help decision makers, social workers, and other public service providers reach not working individuals who are at increased risk of MDAS during pandemics.

Method

Data source

The data source for this study was the repeated national cross-sectional Household Pulse Survey (HPS) collected from July 21, 2021, through January 10, 2022. The data, background information, and other technical documentations are publicly available at the U.S. Census Bureau webpage (U.S. Census Bureau 2022a, 2022b). The HPS is administered by the U.S. Census Bureau, in collaboration with other federal agencies, to collect information on the social and economic impact of the COVID-19 pandemic. I used data from Phase 3.2 (July 21, 2021) onward because that is when the reference period for mental health symptoms, such as depression and anxiety questions, changed from the "last 7 days" to the "last two weeks," as typical for this scale (Zhang et al., 2021). I included adults who were working and not working during the survey weeks. In the HPS, individuals could participate up to three times. I pooled eight waves of cross-sectional data from HPS. I used the personal level weight per wave provided by the Census Bureau to generate nationally representative estimates by taking into account the complex sampling design. Individuals with missing information for any of the outcomes, independent, and

mediator variables and covariates presented below were excluded from the study (around 8% of the total observations).

Measurement of variables

Outcome variable

The outcome variable was major depression and anxiety symptom (MDAS). The HPS has the following two-item Patient Health questionnaire (PHQ-2) (Gilbody, Richards, Brealey, & Hewitt, 2007) that would help measure the frequency of depression symptoms.

1. Over the last 2 weeks, how often have you been bothered by feeling down, depressed, or hopeless?
2. Over the last 2 weeks, how often have you been bothered by having little interest or pleasure in doing things?

The HPS also included the following two-item Generalized Anxiety Disorder scale (GAD-2) (Kroenke, Spitzer, Williams, Monahan, & Löwe, 2007) questions that would help measure the frequency of anxiety symptoms.

1. Over the last 2 weeks, how often have you been bothered by feeling nervous, anxious, or on edge?
2. Over the last 2 weeks, how often have you been bothered by not being able to stop or control worrying?

Each of these four questions had four response options: not at all (0), several days (1), more than half the days (2), nearly every day (3). I summed the responses to the PHQ-2 and to the GAD-2 questions separately. The possible minimum score was 0 and the maximum score was 6. In line with the research in this area, I considered a score equal to 3 or more on each PHQ-2 and GAD-2 to be indicative of MDAS (Donnelly & Farina, 2021; Gilbody et al., 2007; Kroenke, Spitzer, & Williams, 2003; Kroenke et al., 2007; Staples et al., 2019).

Independent variable

The HPS collects information on working status (working or not working) and the main reason for not working for pay or profit for individuals not working during the survey week. Not working individuals were asked to select one of the twelve reasons in Appendix 1. I aggregated these reasons into nine categories. In this study, I used working status and reasons for not working to measure the independent variable. Overall, the variable had

one working status indicator and nine reasons for not working for those individuals who were not working during the survey week (retired, did not want to work, concerned about COVID-19, sick or disabled, caring for children or elders, employer closed temporarily due to COVID-19, laid off, no transportation to work, and other reasons). For discussion purposes, reasons for not working (except not working due to other reasons) were also grouped into three broad categories: retired, decided not to work, and unable to work during the survey weeks. See Appendix 1 for the details.

Mediator variables

During the pandemic, reasons for not working might directly affect the mental health of individuals by negatively affecting their psychological and emotional well-being (Murphy & Athanasou, 1999) or indirectly through a series of COVID-19 related financial strains. For instance, one study showed that financial strain and reduction in personal control were critical mediating factors between job loss and poor health (Price et al., 2002). Food insecurity and inability to pay for rent or mortgage were the most widely mentioned financial hardships associated with not working during the COVID-19 pandemic (Brenan, 2020; Bushman & Mehdipanah, 2022; Center On Budget and Policy Priorities, U. S., 2021; Price et al., 2002). For instance, a study based on the HPS data collected in October 2020, found that respondents who experienced food insufficiency were 1.5 times more likely to use psychotropic medication than individuals without that experience (Nagata, Ganson, Cattle, et al., 2022). Lack of access to health insurance might increase symptoms of anxiety, particularly in states that did not expand Medicaid under the Affordable Care Act (Gangopadhyaya & Garrett, 2020), and for individuals who obtained their insurance through their employers (Lee & Singh, 2021; Murphy & Athanasou, 1999; Nguyen, 2021). A recent study showed that individuals with access to health insurance were less likely to report mental health symptoms such as anxiety and depression during the COVID-19 pandemic than individuals without health insurance (Nguyen, 2021).

I created three variables to measure these mediators: unable to afford buying food, lack of confidence in paying mortgage or rent, and lack of health insurance coverage. Inability to afford food was measured using the HPS question on reasons for food insecurity during the survey week. The variable took a value of "1" if a respondent reported "could not afford to buy more food" as a reason for the food insecurity in the household and "0" otherwise. Lack of confidence in paying mortgage or rent took a value of "1" if a respondent reported that the household had "not at all" or "slightly little" confidence in paying the next rent or mortgage and "0" otherwise. Finally, the variable lack of health insurance coverage took a

value of "1" if a respondent did not have any type of health insurance during the survey week and "0" otherwise. These three variables were assumed to be steps in the pathway between reasons for not working and MDAS.

Covariates

I adjusted the model for the following covariates: age category (18–24, 25–34, 35–54, 55–64, 65+); sex; race and ethnicity (White Non-Hispanic, Black Non-Hispanic, Asian Non-Hispanic, Other Non-Hispanic, Hispanic); marital status (Married, Widowed, Divorced/Separated, Never married); education (High school and less, Some college or associate degree, Bachelor's degree or higher); COVID-19 vaccination status (vaccinated, not vaccinated, vaccination status unknown); number of children 12–17 years old in the family; number of adults in the family; and annual 2020 household income before taxes (Less than $25,000, $25,000–$34,999, $35,000–$49,999, $50,000–$74,999, $75,000–$99,999, $100,000–$149,999, $150,000–$199,999, $200,000 and above). Region (Northeast, South, Midwest, West) and week of the survey were also included to account for regional differences in public support (government-funded assistance and social safety net) to unemployed individuals and changes in mental health during the survey weeks, respectively.

Model

I estimated a survey-weighted multivariable logistic regression to examine the association between reasons for not working and MDAS, controlling for covariates. In our sample, individuals were interviewed more than once (0.20%). This might violate the assumption of independence of observations. To address this issue, I used the Huber-White sandwich estimator (Rogers, 1994) to estimate the model. I also used a mediation analysis to examine how the effects of not working on MDAS were mediated by some variables and if the effects varied by the reasons for not working. Because the outcome variable was binary and there were three mediators, I used a user-written Stata command, Karlson-Holm-Breen (KHB), that decomposes the direct and indirect effects for nonlinear models (Kohler, Karlson, & Holm, 2011). I computed the total, direct, and indirect effects of reasons for not working on MDAS. The total effect of reasons for not working on MDAS was computed by including all variables except the mediator variables in the model, and the direct effect by including all the variables in the model. The difference between the total and the direct effects would measure the indirect effects of reasons for not working on MDAS through the mediator variables explained above. See Kohler et al. (2011) for the details of the

mediation analysis in the context of nonlinear models. For all analyses, I used Stata 17.1.

Results

Study participants included 420,747 non-unique individuals who were interviewed from July 21, 2021, through January 10, 2022, without missing information for any of the variables used in the study (Table 1). These participants represented, on the average, 214.5 million adults who were working and not working for different reasons during any one of the survey weeks in the United States. In the study population, 51.8% were women, approximately one-third were in the 35–54 age category, and 56.9% were married. The share of White Non-Hispanic individuals was 65.2%, one-third had a bachelor's degree or higher, 36.8% had a family income of less than $50,000, and nearly 85% were vaccinated. On the average, 59.4% of the individuals were working and the remaining 40.6% were not working during the survey weeks. Of those who were not working, 46.2% were retired, 14.9% decided not to work (did not want to work, caring for children or elders, and concerned about COVID-19), 20.8% were unable to work (sick or disabled, employer closed temporarily, laid off, and no transportation to work), and the remaining 18.1% did not work for other reasons not mentioned in the publicly available data.

Descriptive results presented in Table 1 showed that 17.0% [95% CI: 16.7%–17.3%] of working individuals reported depression and anxiety symptoms (MDAS) compared with 20.1% [19.6%–20.5%] of not working individuals (Pearson chi^2, $p < 0.001$). It was also notable that there were substantial differences in MDAS across not working individuals. Among the not working group, the percentage of individuals who reported MDAS was highest for those who were unable to work, except for those who decided not to work because of concerns about COVID-19. The percentage of individuals who reported MDAS was 46.6% [95% CI: 38.9%–54.4%] for those who were unable to work because of transportation problems, 38.9% [95% CI: 36.6%–41.0%] for those who were laid off, and 37.6% [95% CI: 36.0%–39.3%] for those who were sick or disabled. The percentage of individuals who reported MDAS was also very high for those who decided not to work because they were concerned about COVID-19 [39.5%, 95% CI: 36.1%–43.4%]. The percentage of retired individuals who reported MDAS was the lowest [7.5%, 95% CI: 7.1%–7.9%] followed by those who did not want to work [18.7%, 95% CI: 16.2%-21.4%] and those working [17.0%, 95% CI:16.7%–17.3%]. See Table 1 for details.

Table 2 presents the survey-weighted multivariable logistic regression results controlling for a variety of potential socioeconomic and

Table 1. Descriptive statistics* by reporting of depression and anxiety symptoms (MDAS).

		MDAS Status‡	
Variables	Total†	No MDAS	MDAS
Number of observations (unweighted)	420,747	358,243	62,504
Number of observations (millions)	214.5	175.4	39.1
Working status (%)			
Working	59.4	83.0	17.0
Not working	40.6	80.0	20.0
Reasons for not working			
Percentage from the not working (%)			
Retired	46.2	92.5	7.5
Didn't want to work	4.7	81.3	18.7
Caring for children or elderly	7.3	73.9	26.1
Concerned about COVID-19	2.9	60.5	39.5
Sick or disabled	11.3	62.5	37.6
Employer closed temporarily	1.9	68.4	31.6
Laid off	6.4	61.1	38.9
No transportation to work	1.2	53.4	46.6
Other reasons	18.1	73.7	26.3
Sex (%)			
Women	51.8	83.8	16.2
Men	48.2	79.9	20.1
Age categories (%)			
18–24	6.99	68.9	31.1
25–34	17.32	73.3	26.7
35–54	34.72	80.5	19.6
55–64	17.96	85.4	14.6
65+	23.01	91.2	8.8
Race and ethnicity (%)			
White Non-Hispanic	65.2	82.6	17.4
Black Non-Hispanic	10.4	80.5	19.5
Asian Non-Hispanic	5.2	87.5	12.5
Other Non-Hispanic	3.6	74.2	25.8
Hispanic	15.6	79.1	21.0
Marital status			
Married	56.9	86.8	13.2
Widowed	4.6	85.6	14.4
Divorced/Separated	13.9	77.1	23.0
Never married	24.6	72.0	28.0
Education			
High school & less	35.6	79.5	20.5
Some college or associate degree	30.6	78.7	21.3
Bachelor's degree or higher	33.8	86.9	13.1
Annual household income in 2020			
Less than $25,000	14.4	68.2	31.8
$25,000–$34,999	10.7	75.5	24.5
$35,000–$49,999	11.7	78.5	21.5
$50,000–$74,999	16.6	83.0	17.0
$75,000–$99,999	12.6	85.9	14.1
$100,000–$149,999	19.5	86.6	13.4
$150,000–$199,999	6.8	90.5	9.5
$200,000 and above	7.7	91.7	8.3
Received COVID-19 vaccination			
No	14.8	76.2	23.8
Yes	85.0	82.8	17.2
Unknown	0.3	77.1	22.9
Childcare problem due to the pandemic			
No	95.5	82.5	17.5
Yes	4.5	67.2	32.8
Family had children 12–17 years old			
No	82.9	82.2	17.8
Yes	17.1	79.5	20.5
Number of adults in the family	2.6	2.6	2.7

(*continued*)

Table 1. Continued.

		MDAS Status‡	
Variables	Total†	No MDAS	MDAS
Region			
Northeast	16.8	83.2	16.9
South	37.9	80.5	19.5
Midwest	20.8	83.2	16.9
West	24.5	81.6	18.4
Survey week			
Jul 21–Aug 2, 2021	12.3	81.7	18.3
Aug 4–Aug 16, 2021	12.3	82.5	17.5
Aug 18–Aug 30, 2021	12.4	81.2	18.8
Sep 1–Sep 13, 2021	12.5	81.3	18.7
Sep 15–Sep 27, 2021	12.3	81.9	18.1
Sep 29–Oct 11, 2021	12.2	82.0	18.1
Dec 1– Dec 13, 2021	12.7	82.4	17.6
Dec 29, 2021–Jan 10, 2022	13.3	81.3	18.7
Unable to afford buying food			
No	82.4	87.0	13.0
Yes	17.6	57.3	42.7
Lack confidence in paying mortgage or rent			
No	87.0	84.9	15.1
Yes	13.0	60.8	39.2
Lack health insurance			
No	91.8	83.0	17.0
Yes	8.2	68.3	31.7

*Weighted using person level weights provided by the U.S. Census Bureau.†Column percentage, ‡ Row percentage.

demographic confounders. All reported odds ratios are adjusted odds ratios (AOR). When individuals were divided into two groups, working and not working, the odds of not working individuals reporting MDAS were 42% [95% CI: 36%–49%] higher than working individuals, controlling for all covariates presented in Table 1. However, not working individuals were not a homogenous group because individuals might not work for different reasons. As indicated in the methods section, not working individuals were divided into nine categories by their reasons for not working during the survey weeks. The results presented in columns 4–5 of Table 2 show the association between reasons for not working and reporting of MDAS, controlling for all covariates. The reference category was working individuals. There was no statistically significant difference in reporting MDAS between individuals who did not want to work and working individuals. The odds of retired individuals reporting MDAS were 34% lower than working individuals, controlling for covariates. On the other extreme, the odds of individuals who were not working because of transportation problems, concerns about COVID-19, layoffs, and health or disability reasons were more than 100% higher than working individuals, and the differences were statistically significant at less than the one percent level. The odds of individuals who were not working because of the temporary closure of businesses reporting MDAS were 67% higher than working individuals.

Table 2. Adjusted odds ratios (AOR) and 95% confidence intervals (CI) for factors associated with reporting major depression and anxiety symptoms (MDAS)*: Multivariable logistic regression results.

Variables	AOR	95% CI	AOR	95% CI
Working status				
Working (Ref.)				
Not working	1.42	1.36–1.49		
Working status and reasons for not working				
Working (Ref.)				
Retired			0.66	0.61–0.72
Did not want to work			0.88	0.73–1.06
Caring for children or elderly			1.17	1.06–1.30
Concerned about COVID-19			2.45	2.08–2.89
Sick or disabled			2.22	2.04–2.41
Employer closed temporarily			1.67	1.33–2.09
Laid off			2.46	2.22–2.73
No transportation to work			2.33	1.72–3.16
Other reasons			1.44	1.35–1.54
Sex				
Men (Ref.)				
Women	1.19	1.14–1.23	1.20	1.16–1.25
Age category				
18–24 (Ref.)				
25–34	1.02	0.93–1.12	0.98	0.90–1.08
35–54	0.79	0.72–0.86	0.74	0.68–0.81
55–64	0.51	0.46–0.56	0.51	0.47–0.57
65+	0.24	0.21–0.27	0.37	0.33–0.41
Race and ethnicity				
Non-Hispanic White (Ref.)				
Non-Hispanic Black	0.74	0.69–0.79	0.72	0.67–0.77
Non-Hispanic Asian	0.62	0.56–0.68	0.62	0.56–0.68
Non-Hispanic Other	1.17	1.08–1.28	1.15	1.06–1.25
Hispanic	0.78	0.73–0.83	0.76	0.71–0.81
Marital status				
Married (Ref.)				
Widowed	1.22	1.11–1.34	1.26	1.14–1.39
Divorced/Separated	1.56	1.48–1.64	1.50	1.43–1.58
Never married	1.47	1.40–1.56	1.43	1.36–1.51
Education				
Bachelor's degree or higher (Ref.)				
High school	1.18	1.12–1.24	1.16	1.11–1.22
Some college or associate's	1.29	1.24–1.34	1.28	1.24–1.33
Annual household income in 2020				
$200,000 and above (Ref.)				
Less than $25,000	3.52	3.19–3.90	3.24	2.93–3.59
$25,000–$34,999	2.85	2.57–3.15	2.72	2.46–3.01
$35,000–$49,999	2.54	2.30–2.80	2.48	2.25–2.73
$50,000–$74,999	2.02	1.84–2.21	1.98	1.80–2.17
$75,000–$99,999	1.65	1.50–1.81	1.62	1.48–1.78
$100,000–$149,999	1.51	1.38–1.65	1.48	1.36–1.62
$150,000–$199,999	1.12	1.00–1.25	1.12	1.00–1.24
Received COVID-19 vaccination				
No (Ref.)				
Yes	1.08	1.03–1.15	1.12	1.06–1.19
Unknown	1.67	0.89–3.13	1.68	0.93–3.04
Had childcare problems				
Yes	1.86	1.72–2.01	1.85	1.71–2.01
No (Ref.)				
Had children from 12–17 years old				
Yes	1.04	1.00–1.10	1.04	0.98–1.09
No (Ref.)				
Number of adults in the household	1.08	1.06–1.11	1.07	1.05–1.10

(*continued*)

Table 2. Continued.

Variables	AOR	95% CI	AOR	95% CI
Region				
Northeast (Ref.)				
South	1.10	1.03–1.16	1.11	1.05–1.18
Midwest	0.92	0.87–0.98	0.94	0.88–1.00
West	1.03	0.97–1.09	1.05	0.98–1.11
Survey week				
Jul 21–Aug 2, 2021 (Ref.)				
Aug 4–Aug 16, 2021	0.94	0.88–1.02	0.94	0.88–1.02
Aug 18–Aug 30, 2021	1.04	0.97–1.12	1.04	0.96–1.12
Sep 1–Sep 13, 2021	1.03	0.96–1.12	1.04	0.96–1.12
Sep 15–Sep 27, 2021	0.98	0.91–1.06	0.99	0.92–1.07
Sep 29–Oct 11, 2021	1.00	0.92–1.08	0.99	0.92–1.07
Dec 1–Dec 13, 2021	0.93	0.86–1.00	0.94	0.87–1.01
Dec 29, 2021–Jan 10, 2022	0.96	0.90–1.04	0.96	0.89–1.03

*Scored 3 or above on each of PHQ-2 and GAD-2 questions.

The odds of individuals who were not working to take care of children or elderly persons and other reasons reporting MDAS were 17% and 44% higher than working individuals, respectively. Most of the coefficients of the covariates took the expected direction.

The association between reasons for not working and MDAS might be moderated by family income. Figure 1 shows the interaction effect of family income and reasons for not working on MDAS. Except for the highest income group, individuals who were not working because they were laid off, did not have transportation to go to work, were sick or disabled, and were concerned about COVID-19 had the highest predicted prevalence of MDAS, controlling for all covariates. For instance, in the lowest household income group ($25,000 & less), the predicted prevalence of MDAS was 45.4% for individuals who were not working because they did not have transportation, 43.4% for those who were concerned about COVID-19, 40.4% for those who were laid off, and 38.9% for those who were sick or disabled, compared with 24.7% for working and 21.7% for retired individuals. Individuals in the highest income group were not affected by lack of transportation or being sick or disabled, but they were affected by being concerned about COVID-19 and being laid off.

The association between reasons for not working and MDAS might also be moderated by sex. Figure 2 presents the interaction effect of sex and reasons for not working on MDAS, controlling for covariates. Overall, women were more likely than men to report MDAS. Both men and women who were not working because they did not have transportation to work, were laid off, were concerned about COVID-19, and were sick or disabled had a higher prevalence of MDAS than working individuals, and individuals who were not working due to other reasons. However, men who were not working because they were caring for children or elders had a higher prevalence of MDAS than women who were not working because of the

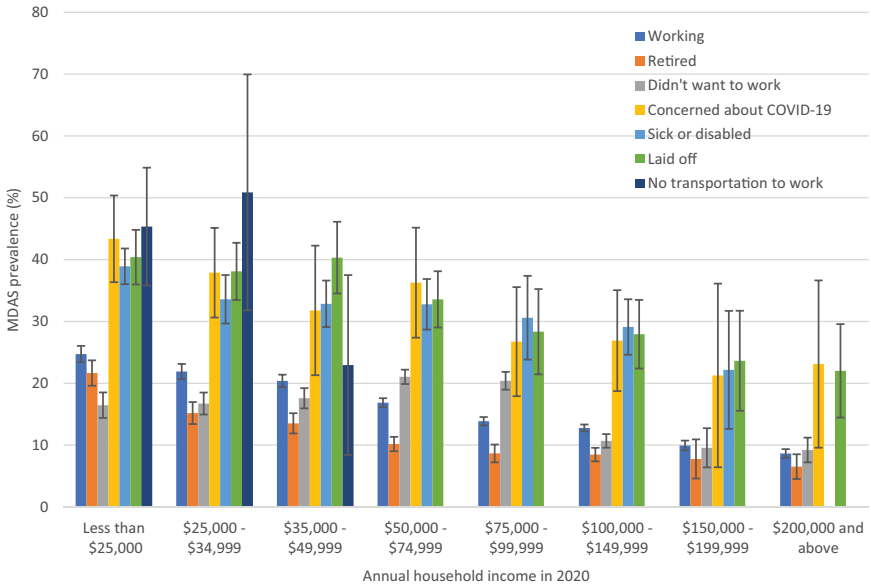

Figure 1. Adjusted predicted prevalence of depression and anxiety symptoms (MDAS) by working status and reasons for not working stratified by household income group (Household Pulse Survey: Jul 21, 2021–Jan 10, 2022).
Note: The adjusted predicted prevalence could not be estimated for individuals who were not working because of lack of transportation to work and annual household income of $50,000 and above and for individuals who were not working because of sickness or disability and annual household income of $200,000 and above due to small sample size.

same reason. Women who were retired or didn't want to work were the least affected.

The study also examined part of the not working population with higher risk of MDAS. The prevalence of MDAS for White women respondents younger than 35 years with an annual household income of less than $35,000 and not working during the survey week because of transportation problems or layoffs was 55.9% (95% CI: 53.2%–58.6%), keeping all other variables constant. As a comparison, the prevalence of MDAS for Asian male respondents aged between 35 and 54 years with an annual household income of $100,000 and above and working during the survey week was 3.3% (95% CI: 2.8%–3.7%). Overall, the highest prevalence of MDAS was among women, White, younger, unmarried, and individuals who were unable to work (detailed results are available upon request).

I also examined the channels through which reasons for not working might affect the mental health of not working individuals. I hypothesized that different reasons for not working might differentially affect the ability of individuals to afford food, pay mortgage or rent, and gain access to health insurance, and these factors in turn would affect their mental health. In other words, the effect of reasons for not working on MDAS could be

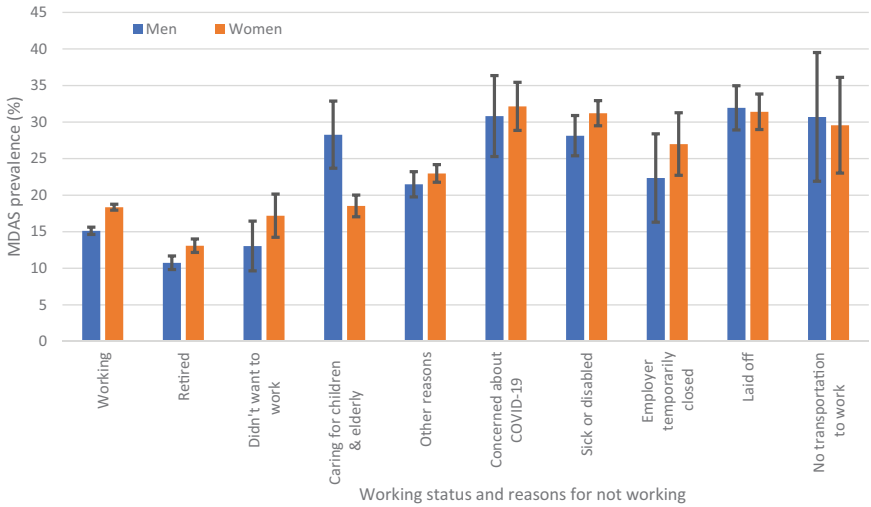

Figure 2. Predicted prevalence of depression and anxiety symptoms (MDAS) by working status and reasons for not working stratified by sex (Household Pulse Survey: Jul 21, 2021–Jan 10, 2022).

mediated through financial constraints related to covering basic expenses such as food, housing, and health insurance. For a mediation analysis to be valid, there should be statistically significant associations between the independent variable (reasons for not working) and the mediator variables, as well as between the mediator variables and the outcome variable, MDAS.

Appendix 2 presents odds ratios from logistic regression models that show the association between reasons for not working and the three mediator variables. The reference category was working individuals. As the graph shows, there were statistically significant associations between the mediator variables (inability to buy more food, lack of confidence in paying mortgage or rent, or not having health insurance) and the reasons for not working. The other condition for mediation analysis was also satisfied as shown in Appendix 3. All mediator variables had statistically significant associations with reporting MDAS.

Results of the mediation analyses are presented in Figures 3 and 4. Figure 3 presents the direct and indirect associations between reasons for not working and MDAS. The indirect effects show associations between reasons for not working that were explained by the three mediator variables. Not working because of retirement, caring for children or elders, temporary business closure, and other reasons were not statistically significantly associated with a reporting MDAS through the three mediator variables. On the other hand, not working because of concerns about COVID-19 (AOR: 1.24), sickness or disability (AOR: 1.16), layoffs (AOR: 1.38), or transportation problems (AOR: 1.32) were statistically significantly associated with reporting MDAS through the mediator variables.

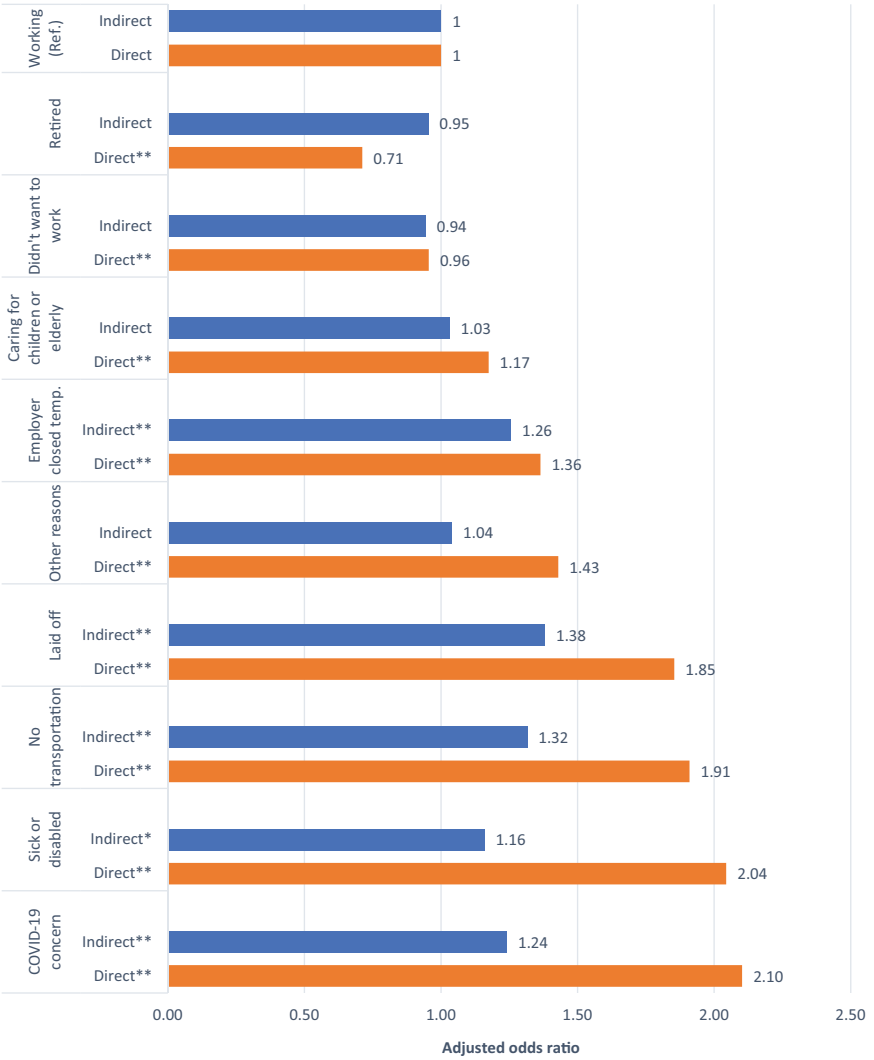

Figure 3. Direct and indirect effects of working status and reasons for not working on reporting depression and anxiety symptoms (MDAS). The reference group is working individuals. $^{*}p < 0.05$; $^{**}p < 0.01$.

Figure 3 also presents the direct associations between reasons for not working and reporting MDAS, controlling for covariates and their indirect impact through the mediator variables. In contrast to the indirect effects, all reasons for not working, except for not wanting to work, were statistically significantly associated with reporting MDAS. Not working because of retirement had a direct effect of reducing the odds of reporting MDAS compared with working (AOR: 0.71). Overall, not working because of concerns about COVID-19 (AOR: 2.10), transportation problems (AOR: 1.91), sickness or disability (AOR: 2.04), and layoffs (AOR: 1.85) were statistically significantly associated with reporting MDAS.

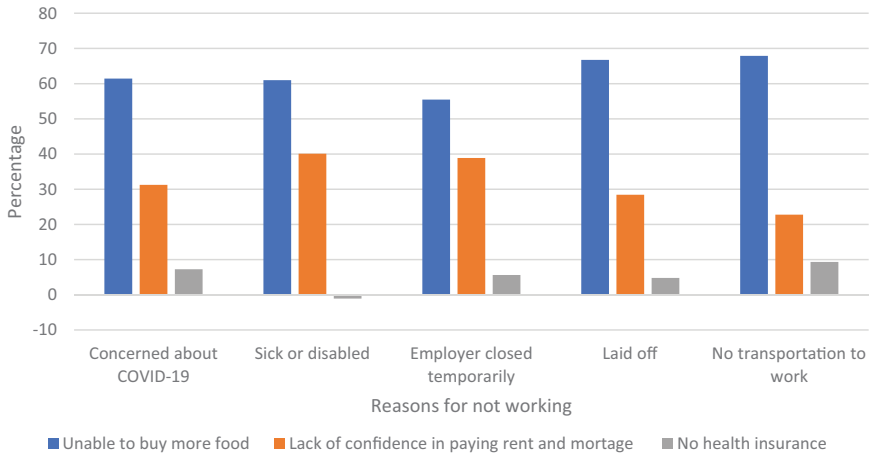

Figure 4. Contribution of mediators to the indirect effects of reasons for not working on reporting major depression and anxiety symptoms (MDAS).

The next important issue was to examine which mediators contributed most to the observed indirect associations between reasons for not working and reporting MDAS. The results are presented in Figure 4. Inability to buy more food followed by lack of confidence in paying rent or mortgage explained most of the indirect associations between reasons for not working and reporting MDAS. Interestingly, reasons for not working showed only a weak association with reporting MDAS from not having health insurance.

Discussion

Individuals may not work because of different reasons, and might respond differently to the economic, social, psychological, and health shocks of not working. Reasons for not working determine how difficult the transition will be when going from working to not working, and how negative or severe the consequences of not working would be on the mental health of not working individuals. This concept has not yet been examined in prior research. Using nationally representative data from July 21, 2021, through January 10, 2022, I provided key insights, even after controlling for household income and socio-demographic variables, how different reasons for not working might exacerbate or ameliorate the mental health consequences of not working during the COVID-19 pandemic in the United States. I used a mediation analysis to verify the possible mechanisms through which different reasons for not working might be associated with the mental health of not working individuals.

Overall, compared with working individuals, controlling for covariates, not working individuals were more likely to report major depression and

anxiety symptoms (MDAS). The results of this study showed that the odds of not working individuals to report MDAS were 42% higher than for working individuals, after controlling for covariates. However, according to this study's results, this comparison could significantly underestimate the association between not working and reporting MDAS for some segments of the not working individuals. In this study, nine reasons for not working were considered. For discussion, these reasons (except not working due to other reasons) were classified into three broad categories: retired, decided not to work, and unable to work. The first category comprised individuals who were retired. In addition to usual factors that affect the decision of individuals near retirement age to retire, the pandemic might have influenced the decision of workers to retire early. A Pew research document showed that in the third quarter of 2021, 50.3% of U.S. adults 55 and older were retired compared with 48.1% in the same quarter in 2019 (Fry, 2021). The study did not show if these differences were statistically significant. In our data, the share of retired individuals among the total not working adult population was 46.2%.

The second group included individuals who decided not to work because of different reasons. Individuals could decide to give up their jobs or not to look for new jobs based on their child or elder care needs and availability and cost of these services in their area. Individuals could also decide not to work for fear of exposing themselves and their family members to COVID-19. During the early period of the pandemic, there were also benefits associated with not working that might affect the decision of individuals not to work. Overall, on the average (average of the eight waves from July 21, 2021, through January 10, 2022) 13 million adults (15% from the total not working adults) decided not to work per study wave. The third group included individuals who were unable to work because of different reasons. Some individuals were unable to work because of transportation problems. The pandemic also forced some small and self-owned businesses to be permanently or partially closed, forcing their workers and owners to be unemployed. For instance, between March 28 and April 4, 2020, 43% of small businesses were temporarily closed because of the pandemic (Bartik et al., 2020). Individuals might also be unable to work because of illness or disability. The share of individuals who were unable to work during the study period among the total not working population was 20.8%. Nearly 18% of not working individuals did not work for reasons not specified in the publicly available data, and it is difficult to know if these individuals decided not to work or were unable to work. Some of these individuals might include not working adults enrolled in different educational and training institutes.

Our results revealed that retired individuals reported the lowest prevalence of MDAS among the adult non-institutionalized U.S. population. Nearly 7.5% [95% CI: 7.1%–7.9%] of retired individuals reported MDAS compared with 17.0% [95% CI: 16.7%–17.3%] of working individuals. The multivariable results also showed that the odds of retired individuals reporting MDAS were 34% [95% CI: 39%–28%] lower than working adults. This result is similar to other findings in this area (Ruffolo, Price, Bonsaksen, et al., 2021; Vahia, Jeste, & Reynolds, 2020). The Centers for Disease Control and Prevention (CDC) showed that during June 24–30, 2020, 6.2% of individuals aged 65 years or older reported anxiety symptoms compared with 49.1% of individuals aged 18 through 24 years (Czeisler et al., 2020).

There are several reasons why retirement may be inversely associated with the reporting of mental health symptoms, particularly during the pandemic. First, retirement can relieve work-related stressors and increase a sense of self-control (Drentea, 2002; Kim & Moen, 2002). This is particularly true during the pandemic because retired individuals have a very low risk of getting COVID-19 from workplaces. Second, compared with other not working individuals, retired individuals may be better prepared for the financial shocks of not working, because retirement is often a planned and expected event for those who choose to retire. In our data, the percentage of retired individuals with annual family income of less than $35,000 was relatively low (26.2%) compared with individuals who were unable to work because of transportation problems (62.8%), sickness and disability (54.4%), and layoffs (48.9%). Third, retired individuals are generally older than working individuals, and may have better emotional and stress control behaviors (Lee et al., 2019; Vahia et al., 2020).

Among those who were not working, individuals who decided not to work, except those who decided not to work because of concerns about COVID-19, reported modest MDAS. This may be partly due to experiencing fewer psychological and financial shocks than those who are forced not to work. During the study period, there was no statistically significant difference in reporting MDAS between individuals who were not working because they did not want to work and working individuals. The odds of individuals who gave up their job or stopped looking for new jobs to take care of children or elders to report MDAS were also modest—17% higher than working individuals.

The only exception in this category was individuals who decided not to work because of their concerns about COVID-19. The odds of these individuals to report MDAS were 145% higher than working individuals. A study conducted based on 1,123 U.S. women from May 21 through August 17, 2020, showed that individuals who reported COVID-19-related health

worries were 2.6 to 4.2 times more likely to report clinically significant mental health symptoms (Liu et al., 2020). The mediation analysis of this study supported this finding. The direct effect of not working because of concerns about COVID-19 on reporting MDAS was higher [AOR: 2.10, 95% CI: 1.8–2.5] than the indirect effects that were mediated through financial and health insurance constraints [AOR: 1.2, 95% CI: 1.1–1.4]. See Figure 3. So, for individuals who decided not to work because of their concerns about COVID-19, results showed that providing financial assistance might not be effective in reducing MDAS.

The highest prevalence of MDAS was among those individuals who were unable to work. In the multivariable logistic regression, the odds of individuals who were unable to work because they had transportation problems getting to work, were laid off, and were sick or disabled were more than 120% higher than working individuals to report MDAS. The odds of individuals reporting MDAS who were unable to work because of temporary business closures were 67% higher than working individuals. These results clearly showed that individuals who were unable to work for reasons beyond their control and did not know when they would return to work reported the most MDAS.

The coefficients of most of the covariates were statistically significant and took the expected direction. Consistent with the literature in this area (Cai et al., 2021; Graham & Chattopadhyay, 2013; Zhang et al., 2021), the odds of women reporting MDAS were 20% higher than men. As age increased, the likelihood of reporting MDAS decreased. A similar inverse relationship between age and anxiety and depression symptoms were reported by other researchers before and during the COVID-19 pandemic (Blanchflower, 2020; Blanchflower & Bryson, 2021; Cai et al., 2021; Vahratian et al., 2021; Zhang et al., 2021). The odds of reporting MDAS were higher for White Non-Hispanic individuals than for Black Non-Hispanic, Asian Non-Hispanic, and Hispanic individuals.

Married individuals were found to experience statistically significantly lower MDAS than never married, widowed, and divorced or separated individuals. Similar results were reported by other researchers during the pandemic (Blanchflower & Bryson, 2021; Chen et al., 2022; Jace & Makridis, 2021). Individuals in the lowest household income group (less than $25,000) were more than three times more likely to report MDAS than individuals in the highest household income group ($200,000 and above). Other researchers also reported similar results during the pandemic (Holingue et al., 2020; McGinty et al., 2020). In an unadjusted analysis (Table 1), 17.2% of vaccinated individuals reported MDAS compared to 23.8% of unvaccinated and 22.9% of individuals whose vaccination status was unknown. However, contrary to our expectations and the literature in

this area (Bilge, Keles, & Baydili, 2022; Chen et al., 2022; Nguyen, 2021), this advantage of vaccination vanished in the multivariable regression. Individuals who reported childcare problems were more likely to report MDAS than individuals who didn't report this problem. The odds of individuals in the Southern region of United States to report MDAS were more than 10% higher than individuals in the Northeast region. Most of the coefficients of the survey week's variables were statistically insignificant indicating that there was no major change in prevalence of MDAS during the data collection period, July 21, 2021, through January 10, 2022.

Our mediation analysis also showed that while the indirect associations between reasons for not working and reporting mental health symptoms were not statistically significant for most individuals who decided not to work, both the indirect and direct effects of reasons for not working showed statistically significant and relatively strong associations for individuals who were unable to work (see Figure 3). For instance, individuals not working because of layoffs, transportation problem, and sickness or disability were highly associated with higher odds of inability to buy more food, lack of confidence in paying mortgage or rent, and not having health insurance (see Appendix 2); these then translated into 38%, 32%, and 16% higher odds of reporting MDAS, respectively, than working individuals (Figure 3). The indirect effects of not working on the reporting of MDAS mediated through not having health insurance were relatively low for all individuals who were unable to work, particularly for those individuals who were unable to work because of sickness or disability (Figure 4). One possible explanation for the weak associations between reasons for not working and the reporting of MDAS mediated through lack of access to health insurance could be the Families First Coronavirus Response Act, which provided additional resources to extend Medicaid coverage to cover COVID-19 related tests to uninsured individuals (Brooks & Schneider, 2020; Gangopadhyaya & Garrett, 2020). The association was particularly weak for individuals who were not working because of illness or disability because nearly 90% of these individuals had health insurance compared with 60% and 75% of individuals who were unable to work because of transportation problems and layoffs, respectively. The direct associations between reasons for not working and reporting MDAS were also very strong for those individuals who were unable to work. All individuals who were not working might not have similar distressing experiences. Individuals who were unable to work may be more likely to suffer from lower self-esteem, social and emotional loneliness, disruption of social networks, family disruption, negative feelings, and other distressing events (Brand, 2015; Jones, 1988; Price et al., 2002; Ruffolo, Price, Bonsaksen, et al., 2021) that might directly affect

their mental health status. Based on the British Crime Survey, one study reported a strong correlation between unemployment and domestic violence (Anderberg, Rainer, Wadsworth, & Wilson, 2016). Studies have also shown that laid-off workers were more likely to have strained relations with coworkers, neighbors, friends, and family members, and thus were more likely to suffer from depression and anxiety (Feldman, 1992; Miller & Hoppe, 1994). Inability to work may also lead to a failure in finding meaning to life and, consequently, to psychological distress (Backhans & Hemmingsson, 2012; Ezzy, 1993).

Our results showed that the direct association between not working and the odds of reporting MDAS for those individuals who were unable to work because of sickness or disability, transportation problems, and layoffs were 104%, 91%, and 85% higher, respectively, than working individuals (Figure 3). These results add new knowledge that could help decision makers and social workers identify the non-working population most at risk for MDAS because of various stressors during the pandemic. These results also underscore where economic and social policy decisions might be more effective in reducing mental health problems such as providing public transportation services and the importance of complementing financial assistance with other measures that would help to reduce the direct psychological impacts of not working, particularly for those who were unable to work.

The study has some limitations. First, causal inference between reasons for not working and reporting MDAS could not be established because of the cross-sectional study design. There may also be an inverse association between reasons for not working and reporting of mental health symptoms because mental health problems may be associated with reasons for not working. Second, variables I used to measure MDAS were derived from large-scale population surveys using self-report and may not reflect clinically confirmed disorders. Third, due to lack of information, I could not control for length of period individuals were not working—an important factor that may affect reporting of mental health symptoms and other health outcomes of not working individuals (Backhans & Hemmingsson, 2012; Silver, Li, & Quay, 2022). Fourth, the COVID-19 vaccination status variable does not show if respondents were fully vaccinated or not. Fifth, the HPS is an internet-based survey that might exclude individuals without access to the internet or who chose not to use the internet. Finally, the response rates in the HPS were very low. During the study period (July 21, 2021, through January 10, 2022), the average response rate was 6.14%. The response rate for each survey week is available at: https://www.cdc.gov/nchs/covid19/pulse/mental-health.htm. This might affect the generalizability of the results.

Conclusion

Not working individuals likely are not homogenous. Reasons for not working may vary across individuals, as different reasons might be associated with differential reporting of mental health symptoms. To date, evidence on the association between reasons for not working and reporting of mental health symptoms is limited. To our knowledge, this was the first study to distinguish not working individuals by their reasons for not working, systemically assessing the relationship between reasons for not working and reported mental health symptoms during the pandemic. The study also examined the direct and indirect associations of reasons for not working with reporting of mental health symptoms of working and not working individuals. Such detailed analysis might allow more practical and targeted policy interventions to reach not working individuals who were disproportionately exposed to MDAS. Using nationally representative survey data, I provide key insights, even after controlling for income and other variables, how different reasons for not working might be associated with the mental health consequences of not working individuals.

The results of this study demonstrate that retired individuals had the lowest prevalence of MDAS and individuals who were unable to work had the highest prevalence of MDAS, followed by individuals who decided not to work. More specifically, individuals who were unable to work because of transportation problems, layoffs, and sickness or disability were significantly and more likely to report MDAS than working individuals and individuals who decided not to work, except individuals who decided not to work because of concerns about COVID-19. These results provide new evidence that not working individuals might not be a homogenous group. Also, the association between not working and reporting MDAS may vary significantly across different reasons for not working, particularly during the COVID-19 pandemic. This implies that public health professionals need to conduct surveillance of the reasons for not working as not working individuals might respond differently to economic and social policies and strategies that aim to reduce MDAS. Interventions should include efforts to identify reasons for not working and to focus on individuals who were unable to work. Such measures may provide tangible benefits to decrease the deleterious effects of the pandemic on mental health.

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Disclosure statement

No potential conflict of interest was reported by the author(s).

Disclaimer

The findings and conclusions in this paper are those of the author and do not necessarily represent the official position of the Centers for Disease Control and Prevention (CDC) or the National Institute for Occupational Safety and Health (NIOSH).

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Data availability statement

The data used in this study—the Household Pulse Survey (HPS)—are publicly available at https://www.census.gov/householdpulsedata.

References

Anderberg, D., Rainer, H., Wadsworth, J., & Wilson, T. (2016). Unemployment and domestic violence: Theory and evidence. *The Economic Journal*, *126*(597), 1947–1979. doi:10.1111/ecoj.12246

Backhans, M. C., & Hemmingsson, T. (2012). Unemployment and mental health – Who is (not) affected? *European Journal of Public Health*, *22*(3), 429–433. doi:10.1093/eurpub/ckr059

Banthin, J., Simpson, M., Buettgens, M., Blumberg, L. J., & Wang, R. (2020). *Changes in health insurance coverage due to the COVID-19 recession: Preliminary estimates using microsimulation* (pp. 1–9). Washington, DC: The Urban Institute.

Bartik, A. W., Bertrand, M., Cullen, Z., Glaeser, E. L., Luca, M., & Stanton, C. (2020). The impact of COVID-19 on small business outcomes and expectations. *Proceedings of the National Academy of Sciences of the United States of America*, *117*(30), 17656–17666. doi:10.1073/pnas.2006991117

Bilge, Y., Keles, E., & Baydili, K. N. (2022). The impact of COVID-19 vaccination on mental health. *Journal of Loss and Trauma*, *27*(3), 285–288. doi:10.1080/15325024.2021.1963558

Blanchflower, D. G. (2020). Unhappiness and age. *Journal of Economic Behavior & Organization*, *176*, 461–488. doi:10.1016/j.jebo.2020.04.022

Blanchflower, D. G., & Bryson, A. (2021). *Biden, Covid and mental health in America.* NBER Working Paper. doi:10.3386/w29040.

Blumenthal, D., Fowler, E. J., Abrams, M., & Collins, S. R. (2020). Covid-19 – Implications for the health care system. *The New England Journal of Medicine*, *383*(15), 1483–1488. doi:10.1056/NEJMsb2021088

Brand, J. E. (2015). The far-reaching impact of job loss and unemployment. *Annual Review of Sociology*, *41*, 359–375. doi:10.1146/annurev-soc-071913-043237

Brenan, M. (2020). *US employees increasingly seeing COVID-19 effects at work*. https://news.gallup.com/poll/305237/employees-increasingly-seeing-covid-effects-work.aspx.

Brooks, T., & Schneider, A. (2020). *The families first Coronavirus response act: Medicaid and CHIP provisions explained.*

Burgard, S. A., Brand, J. E., & House, J. S. (2007). Toward a better estimation of the effect of job loss on health. *Journal of Health and Social Behavior*, *48*(4), 369–384. doi:10.1177/002214650704800403

Bushman, G., & Mehdipanah, R. (2022). Housing and health inequities during COVID-19: Findings from the national Household Pulse Survey. *Journal of Epidemiology and Community Health*, *76*(2), 121–127. doi:10.1136/jech-2021-216764

Cai, C., Woolhandler, S., Himmelstein, D. U., & Gaffney, A. (2021). Trends in anxiety and depression symptoms during the COVID-19 pandemic: Results from the US Census Bureau's Household Pulse Survey. *Journal of General Internal Medicine*, *36*(6), 1841–1843. doi:10.1007/s11606-021-06759-9

Caparros-Gonzalez, R. A., & Alderdice, F. (2020). The COVID-19 pandemic and perinatal mental health. *Journal of Reproductive and Infant Psychology*, *38*(3), 223–225. doi:10.1080/02646838.2020.1786910

Center On Budget and Policy Priorities, U. S. (2021). *Tracking the COVID-19 recession's effects on food, housing, and employment hardships* (Center on Budget and Policy Priorities, Issue. https://www.cbpp.org/sites/default/files/atoms/files/8-13-20pov.pdf.

Ceulemans, M., Hompes, T., & Foulon, V. (2020). Mental health status of pregnant and breastfeeding women during the COVID-19 pandemic: A call for action. *International Journal of Gynaecology and Obstetrics*, *151*(1), 146–147. doi:10.1002/ijgo.13295

Chen, S., Aruldass, A. R., & Cardinal, R. N. (2022). Mental health outcomes after SARS-CoV-2 vaccination in the United States: A national cross-sectional study. *Journal of Affective Disorders*, *298*(Pt A), 396–399. doi:10.1016/j.jad.2021.10.134

Czeisler, M. É., Lane, R. I., Petrosky, E., Wiley, J. F., Christensen, A., Njai, R., … Barger, L. K. (2020). Mental health, substance use, and suicidal ideation during the COVID-19 pandemic—United States, June 24–30, 2020. *Morbidity and Mortality Weekly Report*, *69*(32), 1049–1057. doi:10.15585/mmwr.mm6932a1

Donnelly, R., & Farina, M. P. (2021). How do state policies shape experiences of household income shocks and mental health during the COVID-19 pandemic? *Social Science & Medicine*, *269*, 113557. doi:10.1016/j.socscimed.2020.113557

Drentea, P. (2002). Retirement and mental health. *Journal of Aging and Health*, *14*(2), 167–194. doi:10.1177/089826430201400201

Druss, B. G. (2020). Addressing the COVID-19 pandemic in populations with serious mental illness. *JAMA Psychiatry*, *77*(9), 891–892. doi:10.1001/jamapsychiatry.2020.0894

Ettman, C. K., Abdalla, S. M., Cohen, G. H., Sampson, L., Vivier, P. M., & Galea, S. (2020). Prevalence of depression symptoms in US adults before and during the COVID-19 pandemic. *JAMA Network Open*, *3*(9), e2019686. doi:10.1001/jamanetworkopen.2020.19686

Ezzy, D. (1993). Unemployment and mental health: A critical review. *Social Science & Medicine*, *37*(1), 41–52. doi:10.1016/0277-9536(93)90316-v

Fancourt, D., Steptoe, A., & Bu, F. (2021). Trajectories of anxiety and depressive symptoms during enforced isolation due to COVID-19 in England: A longitudinal observational study. *The Lancet. Psychiatry*, *8*(2), 141–149. doi:10.1016/S2215-0366(20)30482-X

Feldman, D. C. (1992). *Coping with Job Loss: How individuals, organizations, and communities respond to Layoffs*. New York: Free Press.

Fry, R. (2021). *Amid the pandemic, a rising share of older US adults are now retired*. Washington, DC: Pew Research Center. https://pewrsr.ch/3BL5DIj.

Fryer, D., & Payne, R. (1986). Being unemployed: A review of the literature on the psychological experience of unemployment. In C. L. Cooper & I. Robertson (Eds.),

International review of industrial and organizational psychology (pp. 235–277). New York: Wiley.

Gangopadhyaya, A., & Garrett, A. B. (2020). *Unemployment, health insurance, and the COVID-19 recession* (Health Insurance, and the COVID-19 Recession, Issue).

Ganson, K. T., Tsai, A. C., Weiser, S. D., Benabou, S. E., & Nagata, J. M. (2021). Job insecurity and symptoms of anxiety and depression among US young adults during COVID-19. *The Journal of Adolescent Health*, *68*(1), 53–56. doi:10.1016/j.jadohealth.2020.10.008

Gilbody, S., Richards, D., Brealey, S., & Hewitt, C. (2007). Screening for depression in medical settings with the Patient Health Questionnaire (PHQ): A diagnostic meta-analysis. *Journal of General Internal Medicine*, *22*(11), 1596–1602. doi:10.1007/s11606-007-0333-y

Goldmann, E., Hagen, D., El Khoury, E., Owens, M., Misra, S., & Thrul, J. (2021). An examination of racial and ethnic disparities in mental health during the Covid-19 pandemic in the US South. *Journal of Affective Disorders*, *295*, 471–478. doi:10.1016/j.jad.2021.08.047

Graham, C., & Chattopadhyay, S. (2013). Gender and well-being around the world. *International Journal of Happiness and Development*, *1*(2), 212–232. doi:10.1504/IJHD.2013.055648

Grose, J. (2020). The pandemic is a 'mental health crisis' for parents. *The New York Times*. https://www.nytimes.com/2020/09/09/parenting/mental-health-parents-coronavirus.html.

Hammarström, A., & Janlert, U. (2002). Early unemployment can contribute to adult health problems: Results from a longitudinal study of school leavers. *Journal of Epidemiology and Community Health*, *56*(8), 624–630.

Hartley, J., & Fryer, D. (1984). The psychology of unemployment: A critical appraisal. *Progress in Applied Social Psychology*, *2*, 3–30.

Holingue, C., Badillo-Goicoechea, E., Riehm, K. E., Veldhuis, C. B., Thrul, J., Johnson, R. M., … Kalb, L. G. (2020). Mental distress during the COVID-19 pandemic among US adults without a pre-existing mental health condition: Findings from American trend panel survey. *Preventive Medicine*, *139*, 106231. doi:10.1016/j.ypmed.2020.106231

Holmes, E. A., O'Connor, R. C., Perry, V. H., Tracey, I., Wessely, S., Arseneault, L., … Everall, I. (2020). Multidisciplinary research priorities for the COVID-19 pandemic: A call for action for mental health science. *The Lancet. Psychiatry*, *7*(6), 547–560. doi:10.1016/S2215-0366(20)30168-1

Jace, C. E., & Makridis, C. A. (2021). Does marriage protect mental health? Evidence from the COVID-19 pandemic. *Social Science Quarterly*, *102*(6), 2499–2515. doi:10.1111/ssqu.13063

Jones, L. P. (1988). The effect of unemployment on children and adolescents. *Children and Youth Services Review*, *10*(3), 199–215. doi:10.1016/0190-7409(88)90003-5

Kim, J. E., & Moen, P. (2002). Retirement transitions, gender, and psychological well-being: A life-course, ecological model. *The Journals of Gerontology*, *57*(3), P212–P222. doi:10.1093/geronb/57.3.p212

Kohler, U., Karlson, K. B., & Holm, A. (2011). Comparing coefficients of nested nonlinear probability models. *The Stata Journal*, *11*(3), 420–438. doi:10.1177/1536867X1101100306

Kroenke, K., Spitzer, R. L., & Williams, J. B. (2003). The patient health questionnaire-2: Validity of a two-item depression screener. *Medical Care*, *41*(11), 1284–1292. doi:10.1097/01.MLR.0000093487.78664.3C

Kroenke, K., Spitzer, R. L., Williams, J. B., Monahan, P. O., & Löwe, B. (2007). Anxiety disorders in primary care: Prevalence, impairment, comorbidity, and detection. *Annals of Internal Medicine*, *146*(5), 317–325. doi:10.7326/0003-4819-146-5-200703060-00004

Lee, E. E., Depp, C., Palmer, B. W., Glorioso, D., Daly, R., Liu, J., … Yamada, Y. (2019). High prevalence and adverse health effects of loneliness in community-dwelling adults across the lifespan: Role of wisdom as a protective factor. *International Psychogeriatrics*, *31*(10), 1447–1462. doi:10.1017/S1041610218002120

Lee, H., & Singh, G. K. (2021). Monthly trends in access to care and mental health services by household income level during the COVID-19 pandemic, United States, April: December 2020. *Health Equity*, *5*(1), 770–779. doi:10.1089/heq.2021.0036

Liu, C. H., Zhang, E., Wong, G. T. F., Hyun, S., & Hahm, H. C. (2020). Factors associated with depression, anxiety, and PTSD symptomatology during the COVID-19 pandemic: Clinical implications for US young adult mental health. *Psychiatry Research*, *290*, 113172. doi:10.1016/j.psychres.2020.113172

McGinty, E. E., Presskreischer, R., Anderson, K. E., Han, H., & Barry, C. L. (2020). Psychological distress and COVID-19–related stressors reported in a longitudinal cohort of US adults in April and July 2020. *JAMA*, *324*(24), 2555–2557. doi:10.1001/jama.2020.21231

Miller, M. V., & Hoppe, S. K. (1994). Attributions for job termination and psychological distress. *Human Relations*, *47*(3), 307–327. doi:10.1177/001872679404700304

Montgomery, S. M., Cook, D. G., Bartley, M. J., & Wadsworth, M. (1999). Unemployment pre-dates symptoms of depression and anxiety resulting in medical consultation in young men. *International Journal of Epidemiology*, *28*(1), 95–100. doi:10.1093/ije/28.1.95

Mossakowski, K. N. (2009). The influence of past unemployment duration on symptoms of depression among young women and men in the United States. *American Journal of Public Health*, *99*(10), 1826–1832. doi:10.2105/AJPH.2008.152561

Murphy, G. C., & Athanasou, J. A. (1999). The effect of unemployment on mental health. *Journal of Occupational and Organizational Psychology*, *72*(1), 83–99. doi:10.1348/096317999166518

Nagata, J. M., Ganson, K. T., Bonin, S. L., Twadell, K. L., Garcia, M. E., Langrock, O., … Abdel Magid, H. S. (2022). Prevalence and sociodemographic correlates of unmet need for mental health counseling among adults during the COVID-19 pandemic. *Psychiatric Services*, *73*(2), 206–209. doi:10.1176/appi.ps.202100111

Nagata, J. M., Ganson, K. T., Cattle, C. J., Whittle, H. J., Tsai, A. C., & Weiser, S. D. (2022). Food insufficiency and mental health service utilisation in the USA during the COVID-19 pandemic. *Public Health Nutrition*, *25*(1), 76–81. doi:10.1017/S1368980021003001

Nguyen, M. (2021). The psychological benefits of having health insurance during the COVID-19 pandemic. *Review of International Geographical Education Online*, *11*(7), 2314–2320.

O'Brien, G. E. (1986). *Psychology of work and unemployment*. Chichester: John Wiley & Sons.

Panchal, N., Kamal, R., Cox, C., & Garfield, R. (2021). *The implications of COVID-19 for mental health and substance use* (Kaiser family foundation, Issue).

Pfefferbaum, B., & North, C. S. (2020). Mental health and the Covid-19 pandemic. *The New England Journal of Medicine*, *383*(6), 510–512. doi:10.1056/NEJMp2008017

Price, R. H., Choi, J. N., & Vinokur, A. D. (2002). Links in the chain of adversity following job loss: How financial strain and loss of personal control lead to depression, impaired functioning, and poor health. *Journal of Occupational Health Psychology*, *7*(4), 302–312. doi:10.1037//1076-8998.7.4.302

Rajkumar, R. P. (2020). COVID-19 and mental health: A review of the existing literature. *Asian Journal of Psychiatry*, *52*, 102066. doi:10.1016/j.ajp.2020.102066

Rogers, W. (1994). Regression standard errors in clustered samples. *Stata Technical Bulletin*, *3*(13), 19–23.

Ruffolo, M. C., Price, D., Bonsaksen, T., Leung, J., Schoultz, M., Thygesen, H., & Geirdal, O. (2021). Cross-national study of mental health and employment status nine months post social distancing implementation practices. *British Journal of Social Work*, 2021, bcab177.

Ruffolo, M., Price, D., Schoultz, M., Leung, J., Bonsaksen, T., Thygesen, H., & Geirdal, A. Ø. (2021). Employment uncertainty and mental health during the COVID-19 pandemic initial social distancing implementation: A cross-national study. *Global Social Welfare*, *8*(2), 141–150. doi:10.1007/s40609-020-00201-4

Silver, S. R., Li, J., & Quay, B. (2022). Employment status, unemployment duration, and health-related metrics among US adults of prime working age: Behavioral Risk Factor Surveillance System, 2018–2019. *American Journal of Industrial Medicine*, *65*(1), 59–71. doi:10.1002/ajim.23308

Staples, L. G., Dear, B. F., Gandy, M., Fogliati, V., Fogliati, R., Karin, E., … Titov, N. (2019). Psychometric properties and clinical utility of brief measures of depression, anxiety, and general distress: The PHQ-2, GAD-2, and K-6. *General Hospital Psychiatry*, *56*, 13–18. doi:10.1016/j.genhosppsych.2018.11.003

Steptoe, A., & Di Gessa, G. (2021). Mental health and social interactions of older people with physical disabilities in England during the COVID-19 pandemic: A longitudinal cohort study. *The Lancet*, *6*(6), e365–e373. doi:10.1016/S2468-2667(21)00069-4

Thomas, C., Benzeval, M., & Stansfeld, S. A. (2005). Employment transitions and mental health: An analysis from the British household panel survey. *Journal of Epidemiology and Community Health*, *59*(3), 243–249. doi:10.1136/jech.2004.019778

U.S. Bureau of Labor Statistics. (2022). *Job openings and labor turnover survey (JOLTS), 2021*. https://www.bls.gov/jlt/.

U.S. Census Bureau. (2022a). *Household Pulse Survey Public Use File (PUF)*. https://www.census.gov/programs-surveys/household-pulse-survey/datasets.html.

U.S. Census Bureau. (2022b). *Household Pulse Survey Technical Documentation*. https://www.census.gov/programs-surveys/household-pulse-survey/technical-documentation.html.

Vahia, I. V., Jeste, D. V., & Reynolds, C. F. (2020). Older adults and the mental health effects of COVID-19. *JAMA*, *324*(22), 2253–2254. doi:10.1001/jama.2020.21753

Vahratian, A., Blumberg, S. J., Terlizzi, E. P., & Schiller, J. S. (2021). Symptoms of anxiety or depressive disorder and use of mental health care among adults during the COVID-19 pandemic—United States, August 2020–February 2021. *Morbidity and Mortality Weekly Report*, *70*(13), 490–494. doi:10.15585/mmwr.mm7013e2

Viinamäki, H., Koskela, K., & Niskanen, L. (1996). Rapidly declining mental well-being during unemployment. *The European Journal of Psychiatry*, *10*(4), 215–221.

Warr, P. (1987). *Work, unemployment, and mental health*. Oxford: Oxford University Press.

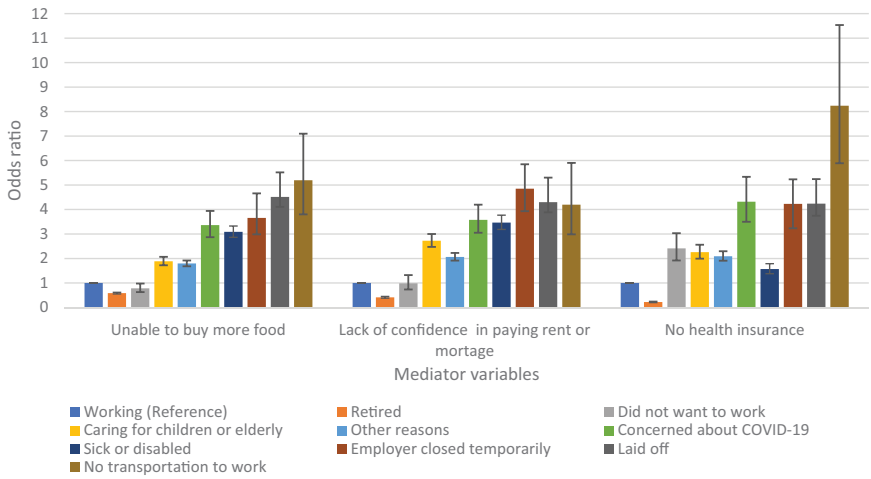
Wilson, J. M., Lee, J., Fitzgerald, H. N., Oosterhoff, B., Sevi, B., & Shook, N. J. (2020). Job insecurity and financial concern during the COVID-19 pandemic are associated with worse mental health. *Journal of Occupational and Environmental Medicine*, *62*(9), 686–691. doi:10.1097/JOM.0000000000001962

Zhang, W., Walkover, M., & Wu, Y. Y. (2021). The challenge of COVID-19 for adult men and women in the United States: Disparities of psychological distress by gender and age. *Public Health*, *198*, 218–222. doi:10.1016/j.puhe.2021.07.017

Appendix 1. Working status and reasons for not working, the census bureau household pulse survey (HPS)

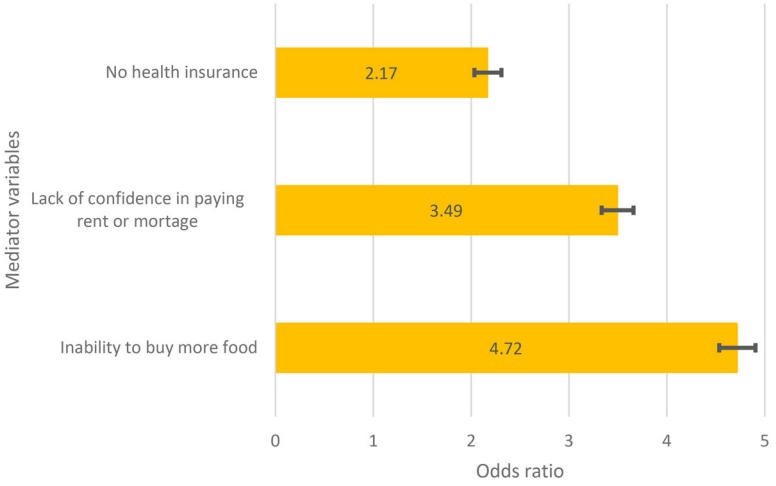
Working status and reasons for not working from the HPS	Working status and reasons for not working used in this study	Broad categories
Working	Working	Working
Retired	Retired	Retired
Didn't want to be employed at this time	Didn't want to work	Decided not to work
Caring for children	Caring for children or elders	
Caring for elders		
Concerned about getting or spreading COVID-19	Concerned about COVID-19	
Sick with COVID-19 symptom or take care of sick with COVID-19	Sick or disabled	Unable to work
Sick (not COVID-19) or disabled		
Employer closed temporarily due to COVID-19	Employer closed temporarily due to COVID-19	
Laid off	Laid off	
Employer out of business due to COVID-19		
No transportation to go to work	No transportation to work	
Other reasons	Other reasons	

Appendix 2. Association between working status and reasons for not working and mediator variables: logistic regression results.



Note: Three independent logistic regressions were run using nine reasons for not working as a dependent variable (working was the reference category) and each mediator as an outcome variable.

Appendix 3. Association between mediator and the outcome variable, major depression and anxiety symptoms (MDAS): logistic regression results.



Note: Three independent logistic regressions were run using each mediator as a dependent variable and MDAS as an outcome variable.