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Social Participation and Self-Reported Depression during the COVID-19 Pandemic among Older Adults

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Abstract

Objectives: The COVID-19 pandemic has increased depressive symptoms and disrupted activities that might typically mitigate depressive symptoms. Pandemic restrictions to social participation that supports well-being in older adults may contribute to worse mental health outcomes, but how participation relates to pandemic depressive symptoms is unclear.

Methods: Using longitudinal data from the nationally representative National Health and Aging Trends Study (N = 3181), we assessed whether older adults' pandemic depressive symptoms were associated with participation in paid work, volunteering, religious services, and other organized activities during the pandemic, as well as changes in participation in these activities compared to pre-pandemic engagement.

Results: Of participation during the pandemic, only attending religious services predicted pandemic depression, with religious attendance associated with higher risk of mild pandemic depressive symptoms. However, for changes in participation, stopping paid work during the pandemic predicted higher risk of moderate/severe pandemic depressive levels, while stopping attending religious services predicted lower risk of mild pandemic depression.

Conclusion: This work demonstrates the importance of social participation for mental health and indicates what types of disruptions may reduce integration to increase older adults' vulnerability to depressive symptoms during a global pandemic.

Keywords

Depressive symptoms; participation; older adults; social integration; COVID-19

Introduction

Depressive symptoms present a serious health concern for older adults (Glass et al., 2006; Santini et al., 2020). A growing literature indicates that the COVID-19 pandemic has increased psychological distress overall (Gorenko et al., 2021; Krendl & Perry, 2021; Vindegaard & Benros, 2020; Xiong et al., 2020), and pandemic-specific distress, such as anxiety, fear, or hypervigilance, may have lasting effects on mental health (Usher et al., 2020). Pandemic distress may be heightened for older adults, as age increases risks of

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severe illness, hospitalization, and mortality from COVID-19 infection (Centers for Disease Control and Prevention, 2021). However, emerging evidence for older adults' pandemic psychological distress is complex, with studies finding older adults experienced increased depressive symptoms and loneliness (Krendl & Perry, 2021), no change in loneliness, (Peng & Roth, 2021), or lower depression compared to younger adults during the early stages of the pandemic (Bruine de Bruin, 2021). Here, we begin to clarify this picture of older adults' pandemic mental health by using nationally representative data to examine how disruption in social routines early in the pandemic shaped older adults' pandemic depressive levels.

Social Participation and Well-Being

One facet of pandemic disruption that may affect older adults' mental health is social participation. Social participation provides social integration that is fundamental to older adults' mental well-being (B. Cornwell et al., 2008; E. Y. Cornwell & Waite, 2009; Glass et al., 2006). Specifically, as aging curtails social roles, social participation becomes an important support for older adults' mental, physical, and cognitive health (Glass et al., 2006; Musick & Wilson, 2003). Participation provides psychological resources, including belonging, mastery, meaning, and reduced loneliness, as well as social and instrumental resources, including informal aid, information, or other material supports (B. Cornwell et al., 2008; E. Y. Cornwell & Waite, 2009; Y. Li & Ferraro, 2005; Thoits & Hewitt, 2001).

Many types of social participation relate to mental health. The benefits of volunteering to mental well-being are well-documented (Burr et al., 2016; Y. Li & Ferraro, 2005; Musick & Wilson, 2003; Thoits & Hewitt, 2001). Theorized mechanisms include increased psychological resources, such as self-esteem and self-efficacy, which in turn improve coping and affect to improve mental health. Volunteering also increases social resources, increasing social interactions that then increase informational and social support (Musick & Wilson, 2003). Benefits of social participation also extend to other forms of organized activities, groups, and clubs (B. Cornwell et al., 2008; C. Li et al., 2018), with research suggesting similar psychological and social mechanisms. For example, among older adults, social participation writ large improves self-efficacy, a sense belonging, social contacts, and social support, as well as directly reducing feelings of psychological distress (C. Li et al., 2018).

As another form of social participation, paid work also predicts lower depressive symptoms (Thoits & Hewitt, 2001). Like other forms of social participation, paid work can relate to mental health through psychosocial resources but participating in paid work also provides economic and financial resources that can support mental health for older adults (Moen & Flood, 2013; Thoits & Hewitt, 2001). Time spent in paid work can also affect participation other social activities for older adults (Moen & Flood, 2013).

Attending religious services presents a more complex association with mental health. Studies find that compared to secular forms of participation, religious attendance or religious-affiliated volunteering decrease (Musick & Wilson, 2003) or increase depressive symptoms (Min et al., 2016). Religious participation can affect mental health by conveying a sense of 'family' belonging routed in personal relationships (Musick & Wilson, 2003), or similar psychosocial resources to other forms of participation, such as self-esteem and self-efficacy (Min et al., 2016). However, religious participation itself may stem from worse

mental health, as those experiencing high depressive levels may be more likely than less depressive individuals to seek out religious engagement (Min et al., 2016). Despite this rich literature on social participation, how participation predicts older adults' pandemic-specific depression remains underexplored.

Change in Social Participation in a Pandemic

In addition to the stress of living through the most consequential pandemic in nearly a century, pandemic mental health may relate to disrupted participation from the social distancing, shelter-in-place, and personal measures taken to reduce viral contagion during early stages of the pandemic (Krendl & Perry, 2021; Usher et al., 2020). Some forms of participation may have been altered more than others. For example, compared to optional engagements like volunteering or organized club meetings, paid work may have been more likely to persist, though pandemic restrictions did lead to substantial increases in unemployment and economic turmoil (Huang et al., 2021; Kämpfen et al., 2020). Additionally, while many activities moved online, older adults generally use technology at a lower rate than younger people, and so many older adults may lack technological access or acumen needed for online participation, or online participation may not have the same mental health benefits as in-person engagement (Antonucci et al., 2017; Beaunoyer et al. 2020). As a result, the pandemic may have limited older adults' access to a typical mental health resource by restricting social participation.

Pandemic depression may also relate differently to separate dynamics of participation. For example, starting or continuing participation in social activities predicts lower subsequent depressive levels compared to stopping or never participating (Choi et al., 2015). While prior work on social participation suggests that lacking social integration during a stressful time leads some older adults to seek out new activities (Thoits & Hewitt, 2001), starting new activities may have been inaccessible or stressful rather than beneficial during the risks and restrictions of the pandemic. In sum, dynamics of social participation from before to during the pandemic may differentially contribute to older adults' pandemic mental health, but these patterns have not yet been thoroughly examined.

The Present Study

This study examines the role of social participation for depressive symptoms specific to the COVID-19 pandemic. Using nationally representative longitudinal data from the National Health & Aging Trends Study (NHATS), we predict pandemic-related depression based on four key domains of older adults' participation during the pandemic: paid work, volunteering, religious attendance, and organized groups and clubs. We then use prospective data comparing pre-pandemic and during pandemic participation to examine four types of participation dynamics for each activity: ongoing participation, continued non-participation, stopping participation, and starting participation. Understanding the role of social participation in pandemic depressive symptoms sheds light on the processes through which the pandemic may damage older adults' mental health and can help to identify which older adults may most need intervention.

Materials and Methods

Data for this study came from the NHATS, conducted by the Johns Hopkins University Bloomberg School of Public Health in collaboration with the University of Michigan. NHATS gathers information, through annual in-person interviews, from a nationally representative sample of Medicare beneficiaries aged 65 and older who live in communities, residential care, or nursing homes within the contiguous United States (i.e., excluding Alaska, Hawaii, and Puerto Rico) in order to foster research that will reduce disability, maximize health and independent functioning, and enhance quality of life at older ages (Kasper & Freedman, 2017). NHATS used Medicare's enrollment database as the sampling frame and oversampled older persons and Black individuals (Kasper & Freedman, 2017). In 2011, 8,245 respondents aged 65 and above completed the initial (Round 1) interview (71% response rate). Respondents have been re-interviewed annually to document change over time. From June through October of 2020, the NHATS administered a COVID-19 supplemental questionnaire via mail, asking questions specific to the pandemic to all sampled persons (SPs) who had participated in the previous regular round of data collection (Freedman & Hu, 2020). The NHATS allows individuals in poor health who are unable to complete the interview independently to receive help in completing the survey, where a designated proxy can assist in completing the interview. Further information on the proxy-assisted interview process is provided by NHATS (Kasper & Freedman, 2017).

Of the 3,961 respondents eligible to participate, 3,257 completed the COVID-19 supplemental questionnaire. In this study, we used data from Round 9 in 2019 (the most recent pre-pandemic wave, collected via in-person interview) and the COVID-19 supplement to provide measures of changes in social participation and depressive symptoms before and after the onset of the pandemic. We restricted our analysis to 3,181 participants (1,810 women and 1,447 men) who had complete data for pandemic depression.

Measures

Pandemic Depression—Drawn from the COVID-19 supplement, the dependent variable, which has been used in recent studies (Robbins et al. 2022; Samuel et al. 2022), measured self-rated feelings of depression during the COVID-19 pandemic. This question asks; 'During the COVID-19 outbreak, in a typical week, how sad or depressed have you felt about the outbreak?' with responses of 'Not at all', 'Mild; I feel sad about it on some days', 'Moderate: I feel sad about it on more than half the days for some of the time' and 'Severe: I feel sad about it nearly every day during the day and at night'. Due to small sample size, responses for 'Moderate' and 'Severe' were combined, yielding three categories of *pandemic depression*: 1) 'Not at all' [reference], 2) 'Mild', and 3) 'Moderate/Severe'.

Social Participation—We assessed four types of social participation: *working for pay, volunteering,* attending *religious services,* and attending *clubs, classes, or other organized activities*. We considered both the status and changes in social participation during the pandemic. The *status* of engaging in each type of participation during the pandemic was measured by asking, 'During the COVID-19 outbreak, have you done any of the following activities either online or in person?', with responses of 'Yes, online', 'Yes, in person', and

'Didn't do during' [reference]. We collapsed in-person and online participation so that each type of participation has a binary yes/no response during the pandemic (Yes = participated online or in-person, No = did not participate) to enable measuring prospective change in participation (comparing pre-pandemic to during pandemic) and to avoid small sample sizes.

To assess participation change, we used measures from NHATS Round 9 (i.e., 2019) of comparable binary yes/no measures on participation in the same activities prior to the pandemic. We then constructed mutually exclusive categories of *changes in participation* based on comparing the binary measures of pre-pandemic and during the pandemic participation, for each of the four activities, as *ongoing participation* (indicated 'Yes' to participation on the activity both before and during the pandemic)*, never participated* (indicated 'No' to participation on the activity both before and during the pandemic), *stopped participating* (indicated 'Yes' to participation pre-pandemic and 'No' during the pandemic), and *started participating* (indicated 'No' to participation on the activity pre-pandemic and 'Yes' during the pandemic).

Additional Controls—To better assess associations between participation and pandemic depression, we controlled for pre-pandemic characteristics drawn from the Round 9 survey that may relate to both participation and pandemic depression. The *pre-pandemic depression* score includes an average of four depression items (α=.75) based on the PHQ-2 and GAD-2 scales. Items assessed frequency in the last month of participants 1) having little interest or pleasure in doing things, 2) feeling down, depressed, or hopeless, 3) feeling nervous, anxious, or on edge, or 4) being unable to stop or control worrying, with possible responses of 'Not at all', 'Several days', 'More than half the days', or 'Nearly every day'. *Chronic conditions* include a count of chronic health conditions, such as heart attack, diabetes, and lung disease, as worse physical health may intensify pandemic health risks and mental health strain. *Caregiving* (0 = did not provide care [reference], 1= provided care) indicates if the respondent reported caregiving for either another adult or a child pre-pandemic. *Low social support* (0 = had at least one confidant [reference], 1 = had no confidant) is a proxy for pre-pandemic social support from a binary indicator for whether respondents reported having no one to talk to about important matters pre-pandemic.

We also controlled for basic demographic characteristics, measured pre-pandemic, that may affect both social participation and pandemic depression, including gender (0 = male, 1 = *female*), *race-ethnicity* (non-Hispanic White [reference], non-Hispanic Black, Hispanic, and other), *age* (65–69 [reference], 70–74, 75–79, 80–84, 85–89, 90 or older), *marital status* (married [reference], cohabited, divorced/separated, widowed, and never married), and *education* (less than high school diploma [reference], high school diploma, some college, college graduate).

We control for other covariates measured during the COVID-19 supplement, including residence type (0 = resides in nursing home facility [reference], 1 = *community dwelling*) and *proxy assisted* (0 = no proxy [reference], 1 = proxy used). Given changing pandemic conditions and restrictions, we also controlled for the month in which in the COVID-19 supplemental questionnaire was completed, as *month of response*, ranging from June to December of 2020. *Residence infection* (0 = no [reference], 1 = yes] indicated whether

respondents reported a residing in a place where an individual (e.g., household member, nursing home staff) had tested positive for COVID-19 infection, as this may affect pandemic stress and depressive levels.

Methods

Because the proportional risk assumption underlying ordered ordinal logistic regression was not satisfied (results testing this assumption available upon request), we used multinomial logistic regressions to assess experiences of 'Mild' and 'Moderate/Severe' pandemic depression relative to the base outcome of 'Not at all'. We first used *status* of social participation during the pandemic to predict pandemic depression, and then examined *changes* in social participation predicting pandemic depression (estimating the status and changes in social participation in separate models due to concerns of multicollinearity). We used multiple imputation with chained equations in Stata to impute missing values on covariates and predictors, using 20 iterations. All analyses were weighted and adjusted for complex survey design per NHATS recommendation, using STATA SVY with Stata Version 16 (StataCorp, 2017).

Results

Table 1 shows weighted descriptive statistics of all analytic variables. In our sample, nearly half (47.65%) of respondents reported mild depression and one out of five (22.96%) reported moderate or severe depression during the COVID-19 pandemic. This pattern suggests that some mild depression due the pandemic may be normative, perhaps unsurprisingly, given the stress and upheaval many experienced during the early stages of a major global pandemic. However, nearly 30% of respondents report no pandemic depression, meaning that examining what factors contribute to experiencing no pandemic depression compared to higher levels of depression is still important for understanding pandemic mental health, even if some depression in the face of a pandemic is not rare.

A majority of our sample did not participate in paid work (87.77%), volunteering (87.64%), religious services (65.36%) or clubs, classes or other organized activities (82.44%) during the pandemic. For changes in social participation, a large share of the respondents never participated, either in 2019 or during the pandemic, in paid work (80.19%), volunteering (68.15%), religious services (41.14%) or clubs, classes or other organized activities (52.81%). Relatively fewer respondents stopped participating in paid work (7.58%) during the pandemic compared to other activities (19.49%, 24.16%, and 29.64% for volunteering, religious services, and clubs, classes, and organized activities, respectively). Attending religious services shows the highest rates of ongoing participation (31.93%) during the pandemic, compared to paid work (10.69%), volunteering (10.06%), or attending clubs/classes/organized activities (14.06%).

A majority of the sample are women (55.58%), non-Hispanic white (84.28%), ages 70–79 (66.17%), married (54.47%), have some college education or above (57.49%), and community-dwelling (94.29%). A majority of respondents did not provide care to others (80.00%) and had at least one confidant (96.95%) before the pandemic, and most of them had no exposure to COVID-19 infection in their residence (95.93%).

Table 2 shows results for participation status during the pandemic predicting pandemic depressive levels. This model examined the status of participating in paid work, volunteering, religious services, and clubs, classes, or other organized activities during the pandemic, net of pre-pandemic depressive levels and demographic covariates. Being female, higher education levels, and higher pre-pandemic depression predicted higher risk of pandemic depression. Proxy-assisted respondents and those reporting low social support pre-pandemic had a lower risk of pandemic depression. Of the participation types, only religious services significantly predicted pandemic depression. Attending religious services was associated with higher risk of mild pandemic depression compared to not attending during the pandemic (RRR = 1.37, $p < .05$).

Table 3 shows results for changes in participation (from before to during the pandemic) associated with pandemic depression, net of covariates. Results indicated that changes in paid work and religious attendance were associated with pandemic depression. Compared to ongoing paid work, stopping paid work (i.e., working for pay prior to the pandemic and not working for pay during the pandemic) predicted higher risk of moderate/severe pandemic depression (RRR = 3.10, $p < .01$). Stopping religious service attendance predicted lower risk of mild pandemic depression compared to ongoing participation (RRR = 0.69, $p < .05$). Changes in volunteering and group/club activities did not significantly relate to pandemic depression.

Sensitivity Analysis

To maximize sample size, we included both respondents living in the wider community and nursing homes or assisted living facilities in our sample, using an indicator for residence type as a control measure. Because residence type may differentially affect participation, we examined models (results available upon request) restricted to community-dwelling residents as a robustness check. All key findings are robust in these models: results for religious participation during the pandemic predicting mild pandemic depression and stopping work predicting moderate/severe depression persisted, and stopping work additionally predicted mild pandemic depression. In these models, stopping religious participation was marginally significant ($p < .10$), but with a similar effect size, suggesting that this difference compared to the full sample may be due to the smaller sample reducing statistical power.

Discussion

The examination of older adults' depressive symptoms specific to the COVID-19 pandemic is a key element of understanding the long-term consequences of an ongoing global health crisis for a particularly vulnerable age group. The pandemic both increased health risks and stressors for older adults and decreased social participation that typically provides a key source of social integration supporting mental health. Examining changes in different types of participation can indicate the role of social participation for older adults' pandemic mental health and speak to broader issues of how social participation supports mental health for older people beyond a specific global crisis. We used nationally representative, longitudinal data to examine older adults' participation during the pandemic and changes from pre-pandemic participation as ongoing, never, stopping or starting participation. We

examined four domains of social activities: paid work, volunteering, attending religious services, and organized classes/clubs/groups. Models show how participation in these activities and changes in participation predicted mild and moderate/severe depressive symptoms related to the COVID-19 pandemic.

Results indicated several ways that participation related to pandemic depression. First, stopping paid work predicted higher risk of moderate/severe pandemic depression. This result persists net of covariates, changes in other participation types, and pre-pandemic depressive symptoms. Individuals who participated in paid work prior to the pandemic but did not work during the pandemic faced higher risks of experiencing moderate or severe pandemic depressive symptoms. This result aligns with prior research indicating the importance of paid work for older adults' social integration and mental health (Moen & Flood, 2013; Thoits & Hewitt, 2001). Stopping paid work may present a particularly severe stressor if it disrupts both social integration and financial security. Those who stopped work may more strongly feel the negative impact of the pandemic in their lives, with attendant increases in pandemic-specific depressive symptoms, or those who experienced the greatest depressive levels may be the most likely to stop work. Regardless of the direction of association, this result indicates that older adults who stopped working for pay during the pandemic are particularly at risk for heightened pandemic depressive symptoms. This result implies that steps to mitigate negative effects of the pandemic for older adults may beneficially focus on helping some working older adults persist in working during the pandemic, such as by promoting flexible measures to work safely while limiting contagion or support for online work. Notably, this and all results here apply to the early stages of the COVID-19 pandemic, and implications of results may not extend to all pandemic stages when factors like vaccination rates, local policies, patterns of remote work and essential work, or contagious variants may affect how participation relates to pandemic depression for older adults.

The second type of social participation that significantly predicted pandemic depressive symptoms is religious attendance. When considered net of covariates, pre-pandemic depressive levels, and other forms of participation, attending religious services during the pandemic was associated with higher risk of mild pandemic depression. When examining changes in participation compared to pre-pandemic, stopping religious participation predicted lower risk of mild pandemic depression, relative to ongoing religious attendance. These results indicate that religious participation during the pandemic could be a detrimental stressor rather than helpful form of social integration, or provide fewer beneficial resources. For example, religious activities during the pandemic may increase the risk of viral exposure and thus increase concerns and stress. Indirectly, efforts to limit exposure may mean religious events are less well attended or accompanying social activities are curtailed. Such factors may reduce the psychosocial resources that typically accompany religious participation, or during pandemic attendance may feel notably less beneficial than pre-pandemic in ways that increase pandemic depression, or fewer resources may make the stress of risking infection outweigh any benefits, making participation increase the risk of pandemic depression. In the same vein, stopping religious participation may reduce risks of pandemic depression by reducing stressful feelings of exposure or minimizing the sense of negative changes in the nature of religious activities due to the pandemic.

Alternatively, individuals experiencing mild pandemic depressive symptoms may be more likely to persist in religious participation than their non-depressive counterparts if they expect social and spiritual benefits, despite any risks from in-person attendance or frustrations with online participation. Those who are not experiencing pandemic depression may be more likely to stop participating if participation during the pandemic presents greater risk of viral exposure or less satisfactory social interaction. However, if those experiencing mild depressive symptoms are more likely to persist in religious participation as an attempted support to mental health, it is unclear why religious participation related only to mild rather than moderate/severe pandemic depression, as this explanation would also expect those experiencing greater depression to also continue religious participation during the pandemic.

This study joins prior work in indicating that religious participation has a complicated relationship with mental health compared to other forms of social participation (Musick & Wilson, 2003). For example, religious attendance has been shown to predict higher depressive levels over time and to have a curvilinear relationship with mental health, as those experiencing worse depressive symptoms feel a greater need to attend (Min et al. 2016). One implication of this finding is that older adults and those looking to improve older adults' well-being during a pandemic may not benefit from relying heavily on religious services to support mental health.

It is worth noting which types of participation did not predict pandemic depressive symptoms in this study. Both volunteering and engaging in organized classes, clubs, or group activities did not significantly relate to pandemic depression, whether considered during the pandemic or as changes from pre-pandemic engagement. These activities may be less central sources of social integration that are more easily postponed during the stress and restrictions of the pandemic, or these activities may be less tightly linked to mental health generally. Future work should consider the differential role of participation activities to better understand how dynamic processes in separate types of participation relate to older adults' mental health.

Additionally, one implication of results is that stopping participation is a key change for older adults' well-being, as both stopping paid work and religious attendance were significant for pandemic depressive levels. Stopping participation creates both disruption and loss of social integration. This combination of both flux and reduction in a previous avenue of integration may particularly strain older adults' mental health. Future work considering older adults' integration should especially consider risks of stopping engagement in previous forms of participation.

Separate from participation, it is noteworthy that having a proxy-assisted interview consistently predicted lower risk of pandemic depression. Proxy respondents may be less able to adequately assess pandemic mental health, which may be less visible than other more tangible survey questions. Alternatively, having a proxy available to assist with an interview may indicate a source of social support or interaction that mitigates pandemic depression risks. Future work should further examine these patterns to understand how such information illuminates social resources available to older adults. Results also show that those reporting

having no one to talk to about important matters prior to the pandemic faced lower risks of mild pandemic depression. This result may suggest that older adults already experiencing social isolation may have encountered less disruption in the early stages of the pandemic, resulting in less risk to mental health compared to their socially supported counterparts. However, only a small sample reported lacking someone to talk to pre-pandemic, meaning future work with more detailed measures of social ties and support and a larger sample should explore how dynamic social experiences may relate to mental health differently than static measures.

This study should be considered in light of limitations. First, our measure of pandemic depression is limited to a single-item self-reported feeling, and future studies should consider broader, more in-depth measures of mental health to better understand the impact of the pandemic on older adults' mental well-being. Yet, previous studies suggest that the single-item self-reported measure of depression can serve an important role in routinely assessing psychological symptoms across a variety of clinical applications and is useful to rule out individuals who do not require further psychological assessment or intervention for depression (Turon et al. 2019).

Second, data provide one snapshot of an evolving health crisis. Data covering subsequent months of the pandemic are needed to fully understand pandemic depressive symptoms and social participation among older adults. The depressive measure used here also limits assessment of the same measure of depressive levels over time, as the outcome specifically measures depressive symptoms due to the pandemic (which cannot be measured prospectively prior to pandemic onset), and future work should examine depressive levels on the same scale prior to and throughout the pandemic to address change in depressive levels more directly.

Third, small sample sizes mean categories of 'starting' participation should be interpreted with caution, as pandemic restrictions meant few older adults started activities assessed here during the pandemic. Small sample sizes also preclude further evaluation of patterns of interest, such as how changes in participation may relate differently to pandemic depressive symptoms by gender, race-ethnicity, geography, or participation modality. Analyses here also examine both community dwelling older adults and those in nursing homes or other residential facilities. Future studies should examine how participation or pandemic contexts may relate differently to pandemic mental health based on residential type.

Fourth, measures of working for pay may carry broader consequences for mental health, such as stressful financial strain, that are not directly related to social participatory aspects of work, and future research should further explore mechanisms linking changes in paid work during the pandemic to well-being. Additionally, this study can only examine changes in any or no participation for four types of activities, and many more nuances of participation or types of activities not captured here may matter for pandemic mental health. Future studies should expand upon these findings by examining more detailed measures of individuals' experiences of participation, such as personal meaning, additional activities, and related factors such as social support that may be important during a pandemic.

Finally, while prospective data enable examining participation over time and pandemic depression net of prior depressive symptoms, models here cannot fully determine causality or temporal ordering of pandemic depression and pandemic participation. Future work should investigate the causal direction of associations between participation during the pandemic and mental health, as well as long-term consequences of the associations described here.

While one study alone cannot make strong recommendations to policy and practice, results here do indicate that older adults who stop working for pay during a pandemic may face substantial pandemic-related depressive symptoms. Policy makers should consider extra steps to ease potential financial and mental health strain among older people moving out of the workforce during a pandemic. Clinicians and other professionals working with older adults may want to consider particular risks to mental health from stopping engagement in previous forms of participation, especially paid work, or recognize that religious participation may not have the expected salutary benefits during the pandemic when making recommendations for older adults' mental well-being. Future researchers should examine long-term consequences of this disengagement, both for post-pandemic workforce participation among older adults and long-term mental health for those who stopped work during the pandemic. Researchers should also consider the complexity of religious attendance as a form of integrative social participation, as results here indicate that stopping participation relates to better mental health than ongoing religious participation. Patterns may differ for different levels of participation, religious denominations, or reciprocal associations between mental health and religious participation.

Results here indicate one way that life during the pandemic has changed for older adults, through social participation, changes in participation, and associated pandemic depressive symptoms. More broadly, results speak to the complex ways in which paid work and religious attendance may be key elements in understanding how social participation relates to healthy aging.

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Table 1.

Weighted Descriptive Statistics, NHATS Round 10 Covid-19 Supplemental Survey

	N	Percentage / Mean	S.D.	Range
Pandemic Depression	3,181			
None at all (base)		29.39%		
Mild		47.65%		
Moderate or Severe		22.96%		
Status of Pandemic Participation				
Working for pay	3,016			
Did not work for pay (ref)		87.77%		
Worked for pay		12.23%		
Volunteering	2,988			
Did not volunteer (ref)		87.64%		
Volunteered		12.36%		
Religious services	2,978			
Did not attend services (ref)		65.36%		
Attended services		34.64%		
Clubs, classes, or other organized activities	2,987			
Did not attend activities (ref)		82.44%		
Attended activities		17.56%		
Change in Participation				
Working for pay	3,014			
Ongoing participation (ref)		10.69%		
Never participated		80.19%		
Stopped participating		7.58%		
Started participating		1.54%		
Volunteering	2,985			
Ongoing participation (ref)		10.06%		
Never participated		68.15%		
Stopped participating		19.49%		
Started participating		2.30%		
Attending religious services	2,973			
Ongoing participation (ref)		31.93%		
Never participated		41.14%		
Stopped participating		24.16%		
Started participating		2.77%		
Attending clubs, classes, or other organized activities	2,983			
Ongoing participation (ref)		14.06%		
Never participated		52.81%		
Stopped participating		29.64%		
Started participating		3.49%		

	N	Percentage / Mean	S.D.	Range
Demographic Characteristics				
Gender	3,257			
Male (ref)		44.42%		
Female		55.58%		
Race-Ethnicity	3,217			
White (ref)		84.28%		
Black		6.66%		
Hispanic		5.60%		
Other		3.46%		
Age	3,257			
65 to 69 (ref)		2.60%		
70 to 74		39.05%		
75 to 79		27.12%		
80 to 84		16.73%		
85 to 89		9.34%		
90 or older		5.16%		
Marital status	3,255			
Married (ref)		54.47%		
Cohabitated		2.12%		
Separated/Divorced		13.80%		
Widowed		26.60%		
Never married		3.00%		
Education	3,218			
Less than HS (ref)		11.47%		
High school diploma		31.04%		
Some college		39.81%		
College degree		17.68%		
Pre-Pandemic Covariates (2019)				
Pre-pandemic depression score	3,219	.35	.57	0 to 3
Chronic conditions	3,236	2.56	1.43	0 to 9
Caregiving	3,251			
Did not provide care (ref)		80.00%		
Provided care		20.00%		
Low social support	3,255			
Had at least one confidant (ref)		96.95%		
Had no confidant		3.05%		
Covid-19 Supplement Covariates				
Residence type	3,257			
Nursing home / Assisted (ref)		5.71%		
Community Dwelling		94.29%		
Residence infection	3,111			
No (ref)		95.93%		

	N	Percentage / Mean	S.D.	Range
Yes		4.07%		
Method of response	3,118			
Sampled person (ref)		88.17%		
Proxy assisted		11.83%		
Month of response	3,257	1.54	1.14	June (0) to Dec (6)

Missing values were handled using multiple imputation.

Table 2.

Estimated Relative Risk Ratios of Pandemic Participation Status Predicting Pandemic Depression from Multinomial Logistic Regression Models, NHATS Round 10 COVID-19 Supplemental Sample (N=3,181)

	Mild Depression vs. None at All		Moderate/Severe Depression vs. None at All	
	RRR	**SE**	**RRR**	**SE**
Pandemic Participation Status *(ref: no participation)*				
Working for pay	0.73	(0.14)	0.71	(0.17)
Volunteering	1.12	(0.19)	1.28	(0.32)
Religious services	1.37*	(0.19)	1.13	(0.19)
Clubs, classes, activities	0.94	(0.16)	0.84	(0.14)
Pre-pandemic depression (2019)	2.08***	(0.31)	4.56***	(0.92)
Female	1.72***	(0.20)	2.71***	(0.38)
Race-Ethnicity (ref: White)				
Black	0.77	(0.13)	0.82	(0.18)
Hispanic	1.14	(0.28)	1.58	(0.47)
Other	1.55	(0.47)	0.81	(0.35)
Age (ref: 65 to 69)				
70 to 74	0.51	(0.20)	0.94	(0.57)
75 to 79	0.55	(0.22)	0.83	(0.48)
80 to 84	0.53	(0.20)	0.98	(0.58)
85 to 89	0.53	(0.20)	0.98	(0.55)
90 or older	0.69	(0.29)	1.64	(0.97)
Marital status (ref: Married)				
Cohabitated	0.63	(0.24)	0.59	(0.29)
Separated/Divorced	0.80	(0.13)	0.87	(0.17)
Widowed	0.94	(0.16)	0.81	(0.14)
Never married	1.28	(0.39)	0.65	(0.25)
Education (ref: Less than HS)				
High school diploma	1.12	(0.20)	1.47	(0.36)
Some College	1.38	(0.24)	2.69***	(0.58)
College Degree	1.57*	(0.33)	2.31**	(0.65)
Chronic conditions (2019)	0.96	(0.03)	1.04	(0.05)
Caregiving (2019)	1.01	(0.15)	1.11	(0.17)
Low social support (2019)	0.36**	(0.12)	1.00	(0.40)
Residence infection	1.39	(0.42)	1.90	(0.82)
Community dwelling	1.39	(0.34)	1.52	(0.54)
Proxy Assisted	0.51***	(0.09)	0.46**	(0.11)
Month of response	1.01	(0.07)	0.87	(0.08)

Notes:

*** $p < .001$

** p < .01

* p < .05

Table 3.

Estimated Relative Risk Ratios of Changes in Participation Predicting Pandemic Depression from Multinomial Logistic Regression Models, NHATS Round 10 COVID-19 Supplemental Sample (N=3,181)

	Mild Depression vs. None at All		Moderate/Severe Depression vs. None at All	
	RRR	**SE**	**RRR**	**SE**
Changes in Participation *(ref: ongoing participation)*				
Working for pay				
Never participated	1.28	(0.24)	1.31	(0.33)
Stopped participating	1.89	(0.61)	3.10**	(1.22)
Started participating	0.94	(0.50)	1.43	(0.84)
Volunteering				
Never participated	0.96	(0.22)	0.83	(0.23)
Stopped participating	0.96	(0.22)	0.89	(0.26)
Started participating	1.26	(0.62)	1.21	(0.62)
Religious services				
Never participated	0.75	(0.11)	0.92	(0.17)
Stopped participating	0.69*	(0.12)	0.86	(0.17)
Started participating	1.13	(0.48)	1.24	(0.58)
Clubs, classes, activities				
Never participated	0.91	(0.20)	1.17	(0.26)
Stopped participating	1.18	(0.25)	1.30	(0.27)
Started participating	0.81	(0.33)	1.00	(0.44)
Pre-pandemic depression (2019)	2.11***	(0.32)	4.63***	(0.93)
Female	1.70***	(0.21)	2.77***	(0.40)
Race-Ethnicity (ref: White)				
Black	0.79	(0.15)	0.84	(0.19)
Hispanic	1.16	(0.30)	1.54	(0.47)
Other	1.56	(0.50)	0.79	(0.34)
Age (ref: 65 to 69)				
70 to 74	0.52	(0.21)	0.92	(0.55)
75 to 79	0.56	(0.23)	0.82	(0.47)
80 to 84	0.54	(0.21)	1.00	(0.59)
85 to 89	0.55	(0.21)	1.03	(0.58)
90 or older	0.70	(0.29)	1.64	(0.99)
Marital status (ref: Married)				
Cohabitated	0.63	(0.24)	0.60	(0.28)
Separated/Divorced	0.80	(0.13)	0.85	(0.17)
Widowed	0.92	(0.16)	0.80	(0.14)
Never married	1.28	(0.39)	0.65	(0.26)
Education (ref: Less than HS)				

	Mild Depression vs. None at All		Moderate/Severe Depression vs. None at All	
	RRR	**SE**	**RRR**	**SE**
High school diploma	1.09	(0.19)	1.42	(0.35)
Some College	1.30	(0.23)	2.56***	(0.57)
College Degree	1.46	(0.32)	2.18**	(0.63)
Chronic conditions (2019)	0.96	(0.03)	1.04	(0.05)
Caregiving (2019)	0.99	(0.15)	1.10	(0.18)
Low social support (2019)	0.38**	(0.13)	1.05	(0.43)
Residence infection	1.36	(0.41)	1.82	(0.79)
Community dwelling	1.42	(0.35)	1.48	(0.52)
Proxy assisted	0.53***	(0.09)	0.48**	(0.12)
Month of response	1.02	(0.07)	0.88	(0.08)

Notes:

*** $p < .001$

** $p < .01$

* $p < .05$