Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

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Brief Report

Factors Associated With Sleep Disturbances Related to the COVID-19 Pandemic Among Older Adults With Chronic Conditions

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ABSTRACT

Objectives: *The COVID-19 pandemic may contribute to sleep problems among older adults with chronic conditions. We examined factors linked to pandemic-related sleep disturbances in a US sample of adults aged 50 and older with chronic conditions.* ***Design:*** *Cross-sectional anonymous online survey between May 14 and July 9, 2020.* ***Setting:*** *Michigan (82.3% of participants) and 33 other US states.* ***Participants:*** *Total of 705 adults (*M = *64.57 years,* SD = *8.82, range = 50–94) who reported at least one chronic condition.* ***Measurements:*** *Sociodemographic and health characteristics, physical activity, media use, pandemic-related stress, social resources, and pandemic-related sleep disturbances.* ***Results:*** *In the fully adjusted regression models, people who reported more worry about COVID-19 infection, more financial strain, and greater loneliness reported significantly greater pandemic-related sleep disturbances.* ***Conclusions:*** *These findings identify factors that may heighten risk of sleep problems since the COVID-19 pandemic in an especially vulnerable subgroup of older adults.* (Am J Geriatr Psychiatry 2021; 29:1160–1165)

Highlights

- We evaluated factors associated with sleep disturbances related to the COVID-19 pandemic among adults aged 50 and older with chronic conditions.
- People who reported more worry about COVID-19 infection, more financial strain, and greater loneliness reported significantly greater pandemic-related sleep disturbances.

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- Older adults with chronic conditions who experience higher levels of pandemic-related stress and perceived social deficits may be susceptible to sleep problems, suggesting that these individuals may benefit from interventions to mitigate these factors.

OBJECTIVE

The COVID-19 pandemic is anticipated to have a major impact on sleep health.[1,2] Older adults are vulnerable to sleep problems from inactivity, social isolation, and home confinement,[1] perhaps especially those with chronic conditions who may be at higher risk of severe illness and death from COVID-19. Understanding factors that heighten risk or foster resilience will inform strategies to maintain the well-being of this high-risk subgroup.

Most people in the United States have been advised to stay at home to limit the spread of COVID-19 since mid-March 2020, resulting in ongoing stressors that may impact sleep.[2] For example, perceiving the pandemic as a major threat to personal finances,[3] family or friend infection,[4] and fear or worry about infection[5] have been associated with greater psychological distress. Indeed, people who are more worried about the pandemic report more sleep problems.[5]

Social support has been linked to fewer sleep problems during the pandemic, along with less anxiety, stress, and depression.[4,6] By contrast, less social capital (actual or potential social resources) has been associated with higher anxiety, greater stress, and poorer sleep quality.[7] Limited opportunities for social engagement during the pandemic may be a precipitating factor for sleep problems.[2]

This study builds on the literature with its focus on risk and protective factors associated with pandemic-related sleep disturbances among individuals aged 50 and older with chronic conditions. Controlling for sociodemographic and health characteristics, physical activity, and media use, we hypothesized that people with greater pandemic-related stress and loneliness would report greater sleep disturbances, whereas people with more frequent social contact and emotional support would report lower sleep disturbances.

METHODS

Participants and Procedures

The sample for this cross-sectional online survey study included 788 individuals recruited between May 14 and July 9, 2020. For recruitment, we used the UMHealthResearch.org opt-in database, the Healthier Black Elders Center Participant Resource Pool of African American adults aged 55 and older in Detroit, Michigan, social media posts, emails shared with the study team's contacts, and word of mouth. People were eligible if they were current US residents aged 50 or older and reported a current diagnosis of at least one chronic condition defined as a condition lasting 3 months or longer.

Participants completed an anonymous 20-minute online Qualtrics survey, which was only available to people who gave electronic informed consent. Participants were not compensated. This study was approved by the Institutional Review Board at the University of Michigan.

We removed 11 people who consented but did not respond to any survey questions. Next, we removed 13 who reported that they did not have a diagnosis of any chronic conditions listed in the survey and did not have any other health problems. We then removed 40 with missing data on chronic conditions and 19 with missing data on other study variables. The analytic sample included 705 individuals ($M = 64.57$ years, $SD = 8.82$, range = 50–94). Relative to the 59 individuals we removed due to missing data, people in this study were less likely to be a person of color ($\chi^2[1, N = 761] = 5.01$, $p = 0.025$) and more likely to have a bachelor's degree or more education ($\chi^2[1, N = 761] = 8.10$, $p = 0.004$).

Measures

Pandemic-related sleep disturbances

Participants reported how much their sleep has been interrupted (1 = *not at all* to 5 = *a great deal*) because of concern about the pandemic.[8]

Pandemic-related stress

Participants separately reported the degree they worried about: 1) themselves and 2) friends or family becoming infected with COVID-19 (1 = *not at all* to 5 = *a great deal*). We created mean scores (Spearman-Brown reliability estimate = 0.84). Participants also reported the extent that they or their families have had financial problems resulting from pandemic-related changes (1 = *not at all* to 5 = *a great deal*). Participants reported their experience (1 = *yes*, 0 = *no*) of 13 pandemic-related stressors (e.g., being an essential worker, own infection) using items from prior work.[8] Items were summed.

Social resources

We assessed social contact by asking how often participants are communicating with people outside their households since the pandemic. Participants reported how often they have received emotional support from family members or friends (e.g., being available to listen to concerns) since the pandemic. Responses (1 = *daily* to 7 = *never*) were reverse-coded. Loneliness was measured with an adapted version of the UCLA Three-Item Loneliness Scale.[9] Participants reported how often (1 = *hardly ever* to 3 = *often*) since the pandemic they: 1) lack companionship, 2) feel left out, and 3) feel isolated from others. We created summed scores ($\alpha = 0.86$).

Covariates

We controlled for age, gender (1 = *female*, 0 = *male or other*), race/ethnicity (1 = *people of color*, 0 = *non-Hispanic White*), educational attainment (1 = *bachelor's degree or higher*, 0 = *less than a bachelor's degree*), and marital status (1 = *currently married/cohabiting*, 0 = *not currently married/cohabiting*).

Participants were asked, since the pandemic, how often: 1) do they feel nervous, anxious, or on edge?, and 2) are they not able to stop or control worrying? (0 = *not at all* to 3 = *nearly every day*) in an average week. We created summed scores (Spearman-Brown reliability estimate = 0.80). Participants reported on their overall physical health before the pandemic (1 = *excellent* to 5 = *poor*), with the item reverse-coded.[10] Participants reported whether (1 = *yes*, 0 = *no*) they currently had a physician diagnosis of 22 chronic conditions (Supplemental Table 1). We summed the conditions. Participants reported their current limitations (1 = *yes, limited a lot* to 3 = *no, not limited at all*) in 10 activities (e.g., vigorous, moderate).[10] Items were reverse-coded and summed. Participants reported how much bodily pain they usually have since the pandemic (0 = *none* to 5 = *very severe*).[10]

Participants reported, since the pandemic, how many minutes per day on 1) weekdays and 2) weekends did they spend physically active (e.g., walking, chores) in an average week (1 = *0–30* to 5 = *more than 120*). We averaged these reports. For digital media use, participants reported, since the pandemic, how much time they spend on an average day on a: 1) TV set, 2) desktop/laptop computer, and 3) smartphone/tablet (1 = *none* to 5 = *6 hours or more*). Items were summed. Participants reported how much time they spend on any social media site on an average day since the pandemic (1 = *none* to 5 = *6 hours or more*).

Statistical Analysis

We conducted multiple linear regressions to determine the independent links between the predictors and pandemic-related sleep disturbances using SPSS version 27. With regard to predictors, Step 1 included the covariates, Step 2 added pandemic-related stress, and Step 3 added social resources. Continuous predictors and covariates were grand mean centered.

RESULTS

Supplemental Table 2 presents scores on major study variables. Table 1 shows that, in the fully adjusted regression model (Step 3), more worry about COVID-19 infection, more financial strain, and greater loneliness were associated with greater sleep disturbances.

CONCLUSION

This study evaluated how stressors and social resources in the early months of the

COVID-19 pandemic were associated with sleep outcomes among older adults with chronic conditions. Overall, adverse social and financial consequences along with worry about infection were linked to

TABLE 1. Multiple Linear Regressions Examining Predictors of Sleep Disturbances Related to the COVID-19 Pandemic for Older Adults With Chronic Conditions

	Pandemic-Related Sleep Disturbances											
	Step 1				Step 2				Step 3			
Parameter	***B***	***SE***	*β*	***95% CI***	***B***	***SE***	*β*	***95% CI***	***B***	***SE***	*β*	***95% CI***
Covariates												
Age	−0.02[c]	0.004	−0.12	−0.03, −0.01	−0.01[b]	0.004	−0.11	−0.02, −0.01	−0.02[b]	0.004	−0.11	−0.02, −0.01
Gender (female)	0.25[b]	0.09	0.09	0.08, 0.42	.25[b]	0.09	0.09	0.08, .41	0.25[b]	0.09	0.09	0.08, .41
Race/ethnicity (person of color)	−0.17	.10	−0.05	−0.36, 0.03	−0.15	0.10	−0.05	−0.34, 0.04	−0.12	0.10	−0.04	−0.31, 0.08
Education (bachelor's or higher)	−0.05	0.08	−0.02	−0.22, .11	−0.08	0.08	−0.03	−0.24, 0.08	−0.07	0.08	−0.03	−0.23, 0.09
Marital status (spouse/cohabiting partner)	−0.21[b]	0.08	−0.09	−0.36, −0.06	−0.21[b]	0.08	−0.09	−0.36, −0.07	−0.18[a]	0.08	−0.08	−0.33, −0.03
Anxiety symptoms	0.32[c]	0.02	0.48	0.27, 0.36	0.25[c]	0.02	0.38	0.20, 0.29	0.23[c]	0.03	0.35	0.18, 0.28
Self-rated physical health	−0.01	0.05	−0.01	−0.11, 0.09	−0.01	0.05	−0.004	−0.10, 0.09	−0.004	0.05	−0.003	−0.10, 0.10
Number of chronic conditions	−0.02	0.02	−0.03	−0.06, 0.02	−0.03	0.02	−0.05	−0.07, 0.01	−0.03	0.02	−0.05	−0.07, 0.01
Functional limitations	0.004	0.01	0.02	−0.02, 0.02	0.001	0.01	0.003	−0.02, 0.02	0.000	0.01	0.000	−0.02, 0.02
Pain intensity	0.03	0.04	0.03	−0.04, .11	0.03	0.04	0.03	−0.05, .10	0.03	0.04	0.03	−0.04, .11
Physical activity	−0.01	0.04	−0.01	−0.07, 0.06	−0.02	0.03	−0.01	−0.08, 0.05	−0.01	0.03	−0.01	−0.07, 0.06
Digital media use	0.01	0.02	0.01	−0.03, 0.04	−0.01	0.02	−0.02	−0.05, 0.03	−0.01	0.02	−0.02	−0.05, 0.02
Social media use	0.05	0.04	0.05	−0.03, .13	0.05	0.04	0.05	−0.02, .13	0.04	0.04	0.04	−0.03, .12
Stress related to the pandemic												
Worry about COVID-19 infection					0.23[c]	0.04	0.20	0.15, .31	0.22[c]	0.04	0.19	0.14, 0.30
Financial strain					0.12[c]	0.03	0.12	0.06, .19	0.11[b]	0.03	0.11	0.05, .18
Total stressors					−0.004	0.02	−0.01	−0.05, 0.04	−0.001	0.02	−0.001	−0.05, 0.04
Social resources since the pandemic												
Social contact									0.04	0.04	0.03	−0.04, .11
Emotional support									0.01	0.02	0.01	−0.03, 0.05
Loneliness									0.05[a]	0.02	0.08	0.01, 0.09
Total R^2	0.362				0.403				0.408			
Change in R^2	0.362[c]				0.041[c]				0.005			

Note. COVID-19 = coronavirus disease 2019. B = unstandardized coefficient. SE = standard error. *β* = standardized coefficient. CI = confidence interval. Parameter significance was assessed with *t* tests (Step 1: *df* = 691; Step 2: *df* = 688; Step 3: *df* = 685). Change in R^2 was assessed with *F* tests (Step 1: *df* = 13, 691; Step 2: *df* = 16, 688; Step 3: *df* = 19, 685). We tested the predictors added in Step 3 separately because this step was nonsignificant, and the pattern of findings was the same for social contact ($p > 0.05$), emotional support ($p > 0.05$), and loneliness ($p < 0.05$). $N = 705$ adults.

[a] $p < 0.05$.

[b] $p < 0.01$.

[c] $p < 0.001$.

sleep problems. These findings suggest that older people with chronic illness may benefit from strategies to mitigate stress and enhance social connectedness.

Consistent with research on health care workers,[5] individuals who were more worried about COVID-19 infection reported greater pandemic-related sleep disturbances. This link was significant over and above the link between anxiety symptoms and sleep disturbances, indicating that worry about infection is a distinct correlate of pandemic-related sleep disturbances. This might be partly explained by the elevated risk for severe illness and mortality from COVID-19 among older individuals with underlying conditions.

People with more financial strain also reported greater pandemic-related sleep disturbances, even after accounting for social resources. Half of the current sample (50.1%) reported at least a little strain, demonstrating that financial concerns were common. Stress and anxiety regarding job security and continuity may have contributed to poor sleep outcomes.

Finally, people who reported greater loneliness reported greater pandemic-related sleep disturbances. Frequency of social contact and emotional support since the pandemic were not independently linked to sleep disturbances, however, suggesting that perceived social deficits may have had a more substantial impact.

We note several limitations. First, the self-selected convenience sample may introduce bias. Second, the findings may not generalize to more representative samples. Third, the cross-sectional analyses did not allow us to examine causal associations. Fourth, the effect sizes were relatively small and may not have clinical significance. Last, the results may be specific to 2–4 months after initial social distancing recommendations. Nevertheless, this study identifies potentially modifiable factors that can be targeted to maintain sleep health among older adults with chronic conditions during this pandemic and in future public health crises.

AUTHOR CONTRIBUTIONS

Courtney A. Polenick is responsible for the data collection, the conception and design of the study, drafting the manuscript, and conducting the analysis. Nikita R. Daniel and Emily A. Perbix are responsible for assisting with the literature review and critically revising the manuscript. All three authors accept responsibility for all aspects of the manuscript and approved the final version of the manuscript.

DISCLOSURE

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The authors report no conflicts with any product mentioned or concept discussed in this article.

SUPPLEMENTARY MATERIALS

Supplementary material associated with this article can be found, in the online version, at https://doi.org/10.1016/j.jagp.2021.03.003.

References

1. Crew EC, Baron KG, Grandner MA, et al: The Society of Behavioral Sleep Medicine (SBSM) COVID-19 Task Force: objectives and summary recommendations for managing sleep during a pandemic [published online ahead of print, 2020 Jun 13] Behav Sleep Med 2020: 1–3;doi:10.1080/15402002.2020.1776288
2. Kutana S, Lau PH: The impact of the 2019 coronavirus disease (COVID-19) pandemic on sleep health [published online ahead of print, 2020 Sep 7] Can Psychol 2020;doi:10.1037/cap0000256
3. Holingue C, Badillo-Goicoechea E, Riehm KE, et al: Mental distress during the COVID-19 pandemic among US adults without a pre-existing mental health condition: findings from American trend panel survey. Prev Med 2020; 139:106231
4. Du J, Dong L, Wang T, et al: Psychological symptoms among frontline healthcare workers during COVID-19 outbreak in Wuhan. Gen Hosp Psychiatry 2020; 67:144–145;doi:10.1016/j.genhosppsych.2020.03.011
5. Zhang C, Yang L, Liu S, et al: Survey of insomnia and related social psychological factors among medical staff involved in the 2019 novel coronavirus disease outbreak. Front Psychiatry 2020; 11:306;doi:10.3389/fpsyt.2020.00306
6. Xiao H, Zhang Y, Kong D, et al: The effects of social support on sleep quality of medical staff treating patients with coronavirus disease 2019 (COVID-19) in January and February 2020 in China. Med Sci Monit 2020; 26:e923549;doi:10.12659/MSM.923549

7. Xiao H, Zhang Y, Kong D, et al: Social capital and sleep quality in individuals who self-isolated for 14 days during the coronavirus disease 2019 (COVID-19) outbreak in January 2020 in China. Med Sci Monit 2020; 26:e923921;doi:10.12659/MSM.923921
8. Merikangas K, Milham M, Stringaris A, et al. The CoRonavIruS Health Impact Survey (CRISIS). Adult Self-Report Baseline Form, 2020
9. Hughes ME, Waite LJ, Hawkley LC, et al: A short scale for measuring loneliness in large surveys: results from two population-based studies. Res Aging 2004; 26:655–672;doi:10.1177/0164027504268574
10. Ware JE Jr.: SF-36 health survey. In: Maruish ME, ed. The Use of Psychological Testing for Treatment Planning and Outcomes Assessment, 2nd ed., Mahwah, NJ : Lawrence Erlbaum Associates Publishers, 1999:1227–1246