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Impact of Coronavirus Disease 2019 on Geriatric Psychiatry



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KEYWORDS

• COVID-19 • Geriatrics • Mental health • Loneliness • Social isolation

KEY POINTS

- Social isolation has a significant negative impact on the both physical and mental health of older adults.
- Pre-existing health disparities and inequities in our communities were severely exacerbated by the pandemic.
- Physical inactivity in older adults led to worse physical and mental health outcomes.

INTRODUCTION

The twenty-first century has seen a resurgence of infectious diseases causing epidemics and pandemics. Initially seen as a regional disease, the coronavirus disease 2019 (COVID-19), caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), quickly and relentlessly spread across the globe. Unlike other recent viral diseases, COVID-19 was not circumscribed to a particular population or region. It affected everyone and caused unprecedented changes in day-to-day life for the entire world. As a new disease, it also brought with it a tremendous amount of uncertainty about how it spreads, who is more susceptible, and the possible harms it could cause.

Much has been learned about the virus since it first appeared in 2019. According to the World Health Organization (WHO), there have been more than 200 million confirmed cases of COVID-19 and more than 5 million deaths from the disease.¹ According to the Centers for Disease Control and Prevention (CDC), the United States has had almost 40 million cases and more than 600,000 deaths.² Older adults and those with comorbid medical disorders have higher mortalities. As older adults tend to have more chronic illnesses than younger adults, they have been significantly

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impacted by COVID-19. Eight out of 10 deaths from COVID-19 in the United States occurred in adults aged 65 years and older.³

Meeting the mental health needs of older adults has always been challenging, and coupled with the pandemic, it became very difficult. Previously sound and clinically impactful recommendations for mental and physical well-being, such as regular socialization, group exercises, adult day programs, and so forth, were no longer available and placed this population at increased risk of infection. Telepsychiatry was adopted as a way of maintaining treatment relationships with patients. However, this supposes that older adults have access to an Internet-capable device (eg, computer, tablet, or smartphone), live in an area with reliable broadband connectivity and are able to afford it, and that they are able to navigate the different telehealth services used by their providers. The challenge moving forward is to continually adapt to the changing landscape of care while simultaneously providing quality care for patients and support for their loved ones.

EPIDEMIOLOGY

Age has been shown to be the strongest risk factor for severe COVID-19 disease. Data from the CDC show that older adults have significantly higher rates of hospitalization and death when compared with children and younger adults even if the risk of infection is about the same.³ Hospitalization rates range from 40× in those 65 to 74 years old to 65× in those 75 to 84 years old, to 95× in those older than 85 years. The calculated mortalities are even more astounding at 1300× (65–74 years old), to 3200× (75–84 years old), to 8700× (>85 years). More than 80% of COVID-19 deaths occurred in people older than 65 years of age.^{4,5}

Long-term care facility residents were an exceptionally vulnerable population. They had a disproportionate number of cases spurred on by their communal nature, high percentage of residents with chronic illnesses, as well as the close proximity required for many of their care needs. Long-term care facilities had high rates of severe cases, hospitalization, and death. This population makes up less than 1% of the US population but accounted for more than 35% of all COVID-19 deaths.^{6,7}

SOCIAL ISOLATION

One of the most notable changes during the COVID-19 pandemic for the older adult population with or without preexisting mental health problems has been the significant increase in social isolation. Social isolation relates to the lack or deficits seen in the objective characteristics of an individual's social network or relationships,⁸ whereas loneliness refers to the negative feeling derived from the discrepancy between the desired and actual social network or relationships.⁹

For many older adults, social isolation happened swiftly with little or no warning as countries suddenly implemented nationwide lockdowns. Because older adults experienced worse COVID-19 morbidity and mortality outcomes, national disease control centers focused much of their education and messaging on the importance of establishing and maintaining physical distance from others. As a result, unless they lived in the same household as other family members, older adults were separated from their families and friends for long periods of time regardless of whether they lived in their own homes or in a long-term care facility. Before the pandemic, certain underserved older adult populations (black, indigenous, and other people of color; those living in poverty; those being homebound; and those living in rural communities) were at higher risk of social isolation with the impact only worsening with the pandemic.¹⁰

Social connectedness plays an important role in maintaining health and quality of life and has been shown to help reduce both morbidity and mortality.¹¹

A meta-analysis completed by Holt-Lunstad and colleagues¹² revealed a 50% increased likelihood of survival in individuals with strong social relationships and remained steady across several variables, including age, sex, and health status (odds ratio [OR] = 1.5). The association was found to be higher with more complex measures of relationships (OR = 1.9) than with binary measures of social relationships (OR = 1.19). The investigators conclude that the effects of social relationships on mortality are comparable to the effects seen on well-established risk factors for mortality, such as smoking and alcohol use, and more than is seen with lack of physical activity and obesity.

In an ongoing study started before the pandemic, Rolandi and colleagues¹³ assessed baseline use of social networks. Those in the intervention group received training in social network sites use, including smartphone use, Facebook and WhatsApp use, privacy rules, and fraud risk prevention using Facebook. Participants 81 to 85 years old were contacted during the pandemic, a year following the initial post-evaluation assessments. Participants that had received social network site training had higher usage of such sites, had fewer feelings of being left out, and had a smaller reduction in their social network contacts. This provides evidence of the benefits of training older adults in the use of available and new technologies and continually combating ageism related to such trainings.

Other helpful strategies to combat social isolation and loneliness include old-fashioned letter writing, phone calls, video calls, pet therapy, and self-guided or clinician-guided remote psychological interventions, including cognitive behavioral therapy, problem-solving therapy, and life review.^{14–17} It is important to keep in mind that the technological limitations discussed earlier will affect the feasibility and quality of implementing some of these interventions.

MENTAL HEALTH

The proportion of older adults worldwide is increasing and doing so rapidly. According to the WHO, the population of people 60 years of age and older is estimated to increase from 12% in 2015 to 22% by 2050.¹⁸ More than 20% of people 60 years of age and older suffer from a mental or neurologic disorder, whereas 6.6% of all disability in this age group is due to these disorders.¹⁸ Depression and dementia are the most common disorders affecting 7% and 5% of the population, respectively.¹⁸ Anxiety affected 3.8% and substance use disorders affected 1%.¹⁸ Of suicide deaths worldwide, 25% was in people 60 years of age and older.¹⁸

Social isolation has been associated with increased risk of depression and anxiety in older adults.¹⁹ However, many studies showed a more significant impact on the mental health of younger people (<35 years), on women, on those with low income, and in the unemployed than in older adults.^{20–22} These studies were carried out earlier during the pandemic and involved completing online surveys. Surveys completed during the later stages of the pandemic showed significant negative impact on mental health, highlighting the difference in impact of acute versus chronic stress on older adults.²³ One multinational study involving 33 countries showed that being separated from family and close friends predicted depression and anxiety.²⁴ Having conflicts with other adults in the home was the largest predictor of anxiety and the second largest predictor for depression. Living in a higher-income country was the biggest predictor of depression and the second biggest predictor of anxiety. Geographic differences emerged, with Europe and Central Asia having the highest levels of depression followed by North America, Sub-Saharan Africa, East Asia and Pacific, and Latin America and the Caribbean. For anxiety, the top 3 regions remained the same as seen in depression, but Latin America and the Caribbean had higher levels than East Asia and the Pacific.

Not having a partner and receiving treatment for COVID-19 were positively associated with depression, whereas increased workload responsibility was negatively associated with depression. Other factors associated with depression and anxiety include prolonged separation from social networks, female gender, trans/nonbinary identification, and difficulty with work transition.

The COVID-19 Coping Study²⁵ showed a high prevalence of anxiety, depression, and loneliness when compared with prepandemic levels. There were strong associations between these 3 and increased alcohol consumption in the past week when compared with prepandemic levels.

According to the National Poll on Healthy Aging,²⁶ most of the respondents (59%) had no changes in their alcohol consumption, whereas 27% reported a reduction in alcohol consumption when compared with prepandemic levels. Those who reported lack of companions were more likely to have increased their alcohol consumption during the pandemic (19% vs 12%) as were those who reported feeling isolated compared with those who did not (19% vs 10%).

Suicide is a major public health issue. There has been an increase in suicide ideation, attempts, and death in at-risk populations in time of crises.²⁷ Loneliness is a known risk factor for suicide and has been associated with worse health outcomes.¹²

Hobfoll and colleagues²⁸ identified empirically supported strategies that could be used for mass trauma intervention and management. They recommend promoting a sense of safety, calming, a sense of self and community efficacy, connectedness, and hope. Many studies emphasize the importance of finding new ways to establish and maintain connections with a great deal of focus on telehealth. Telephone and video-based interventions have been shown to be effective in the management of depression, anxiety, posttraumatic stress disorder (PTSD), and adjustment disorder.²⁹

PHYSICAL HEALTH

National and local lockdowns put in place as a result of the COVID-19 pandemic negatively affected the physical health of older adults in multiple ways. The lockdowns imposed a significant restriction on what, when, where, and how much physical activity older adults could do. In older adults, physical inactivity has been found to contribute significantly to disability and is the fourth highest risk factor for mortality in this age group.^{30,31}

Reduced physical activity increases the risk of falls and all its ensuing complications. Maintaining physical activity is important in preserving independence, mental health, and physical health in older adults.³² Researchers have found significant decline in physical activity in older adults during this pandemic. Older adults who were hospitalized during the pandemic, either with COVID-19 or for other reasons, had even more severe physical effects.^{32,33}

Researchers have recommended walking, exercise games on video game consoles, interactive rehabilitation technologies, or exercise DVDs that require no Internet connection but do require a DVD player.^{34,35} A major concern has been the ability of older adults to complete these exercises safely while unsupervised by a health care provider, which is pertinent during this pandemic. The Preventing Loss of Autonomy by Treatment Post-Hospitalization tool, a home-based intervention, can be individually tailored based on a person's balance and strength profile and has been shown to be safe and efficient in older adults after hospitalization.³⁶

Malnutrition is commonly found in older adults, especially when hospitalized.³⁷ There was increased concern about malnutrition in older adults during the pandemic, especially in those who had little or no support systems. This concern was worsened

by increased food insecurity with the economic impact of the pandemic, food supply issues, and shortages especially at the beginning of the pandemic, and changing eating habits.^{38,39} The effect of malnutrition on older adults hospitalized with COVID-19 was even worse. Malnutrition impairs the immune system and increases risk of infections along with its associated increased risks of morbidity and mortality.⁴⁰ Infections themselves can also worsen malnutrition, creating a vicious cycle in which cause and effect become difficult to differentiate.

Another way that lockdowns have affected physical health is in delay of treatment of physical ailments especially if there were preexisting medical conditions that put them at higher risk of infection of the virus.³⁹ Anxiety about being infected with COVID-19 led many to avoid hospitals entirely. Routine surveillance for chronic disorders, cancers, and such was delayed; routine vaccinations were skipped.

COVID-19 affected sleep in older adults. The National Poll on Aging found that 64% of people aged 50 to 80 years old had difficulty falling or staying asleep at least once the previous week. This was double the percentage of a 2017 poll conducted in a comparable group of older adults.⁴¹ Impaired sleep can have a negative impact on cognition, including attention, working memory, long-term memory, and decision making.⁴²

COGNITIVE IMPACT OF CORONAVIRUS DISEASE 2019

COVID-19 is associated with neurologic disorders, including encephalopathy and anosmia. Greater than 80% of those infected have some form of neurologic manifestation.⁴³ The neurologic symptoms observed included cerebrovascular accidents (ischemic and hemorrhagic), delirium, encephalopathy, agitation, and seizures.⁴³ Patients with more severe neurologic disease as a result of infection tended to be older.⁴⁴

People with dementia are vulnerable to infection because of they may be unable to understand the significance or impact of the disease and thus are less able to comply with public health recommendations for minimizing spread, such as wearing masks and maintaining distance from others. Dementia patients who require assistance with activities of daily living are limited in their ability to minimize their social contacts, thus increasing risk. A significant proportion of persons with dementia reside in long-term care facilities, which had high rates of severe cases, hospitalization, and death from COVID-19 and accounted for more than 35% of all COVID-19 deaths.^{6,7} There are data to suggest that increased mortality is associated with dementia, cerebrovascular accidents,^{45,46} and ApoE4 homozygosity.⁴⁷

HEALTH CARE DISPARITIES

As with other patient populations, the COVID-19 pandemic highlighted chronic racial and ethnic health care disparities. One's ZIP code has been shown to have a greater effect on health than genetics.^{48,49} Nursing homes with higher nonwhite residents experienced 3.3-fold higher death rates when compared with those with the highest percentages of white residents and were associated with larger nursing home size and the local COVID-19 prevalence rates.^{50,51}

Health care disparities between rural and urban populations persisted. Rural populations tend to have reduced access to health care, lower capacities in health care facilities with greater distances to travel to these facilities, a higher percentage of older adults, more chronic illnesses, lower access to reliable broadband technology, lower use of smartphones and so forth, and fewer economic resources.⁵² Geographic distance initially spared rural populations from the full brunt of the pandemic when compared with high-density urban areas. However, once the virus was detected in the community, the toll was just as severe.⁵³

Rural areas with higher proportions of ethnic minorities, including black and indigenous peoples, experienced higher rates of severe illness and death from COVID-19.^{54–56} Older adults living in long-term care facilities had the worst outcomes from COVID-19, and this was found in numerous studies across the globe. They accounted for most of the mortality associated with the disease, with mortalities ranging from 19% to 72% of all deaths.⁵⁷

ELDER ABUSE

The pandemic caused significant social, interpersonal, and financial distress that cut across the entire population. Caregiving is associated with worse mental and physical health outcomes.⁵⁸ The added stress from the pandemic has led to reports of increased rates of abuse.^{59–61} The social isolation engendered by the pandemic meant that avenues that caregivers would have used to help alleviate stress were no longer available to them or there was very limited availability. At the same time, the isolation meant that any older adult being abused was less likely to be noticed by an outside person or agency, such as Adult Protective Services. Other ways the pandemic could increase risk include increased demand on caregiver resources, such as time and money, increased caregiver substance use, and increased purchase of weapons.⁶²

Elder abuse can be physical, psychological, sexual, or financial. Before the pandemic, the estimated yearly prevalence of people 60 years and older who had experienced some form of abuse was 10%.⁶³ In the pandemic era, Chang and Levy⁶⁴ found the overall prevalence of elder abuse to be 21.3%, an 83.6% increase when compared with prepandemic levels. The rate of reported physical abuse went from 1.6% to 5.4%, an astounding increase of 237.5%, and financial abuse increased from 3.5% to 7.5%, an increase of 114.3%. The study did not find significant increase in verbal abuse (9% vs 9.2%, an increase of 0.02%). Of note, this study did not include older adults with poor health conditions and limited resources, including those living with dementia. It is, therefore, possible that these estimates lean on the more conservative side. Societal connectedness and stronger sense of community were associated with reduced risk.

To help mitigate elder abuse, increased awareness is key. Screening for elder abuse should be a regular part of the assessment of older adults regardless of the specialty and will require appropriate education and training of everyone involved in caring for older adults. Telemedicine can play an important role, as videos can provide the clinician with an insight into the patient's home and living situation. Changes on the individual level will likely not be enough for long-term changes and will require societal and structural changes, including providing more resources for at-risk older adults and their families, for example, for housing, food, reliable broadband access, providing Adult Protective Services with adequate funding.^{64,65}

IMPACT OF CORONAVIRUS DISEASE 2019 ON GERIATRIC PSYCHIATRY WORKFORCE

Older patients were not the only ones affected by the COVID-19 pandemic. The pandemic affected everyone everywhere in one way or another. There was uncertainty about this new virus, the overwhelming number of deaths, fear of contracting the virus; shortages of hospital beds, ventilators and other equipment, and personal protective equipment (PPE); and lack of knowledge about which PPE were appropriate to use and when. Coupled with the seemingly shifting recommendations from national health bodies that were working with incomplete knowledge of the virus, these circumstances created an environment rife with uncertainty and anxiety.

In epidemics, such as the severe acute respiratory syndrome, Middle East respiratory syndrome, Ebola, and H1N1 epidemic, health care workers have been shown to

have high prevalence rates of anxiety (45%), depression (38%), acute stress disorder (31%), burnout (29%), and PTSD (19%) during and after the epidemics.^{66,67} These significant negative mental health outcomes were found to be associated with female gender, younger age, nurses, less job security, and frontline work.

Results from cross-sectional surveys completed during the current COVID-19 pandemic show worse outcomes in nurses and physician trainees with more impact on their mental health.^{68,69}

Physicians and nurses are more often exposed to traumatic events in the course of their work and in prepandemic times have been shown to have higher rates of PTSD than non-health care workers (14.8%⁷⁰ and 18%,⁷¹ respectively, vs 7%–8%⁷²). Long-term care facility workers also experienced substantial negative outcomes during the COVID-19 pandemic. There was inadequate staff education about infection control, inadequate access to PPE, significant staff turnover rates owing to safety concerns, staff COVID infections, and burnout.⁷³

A survey of 653 health care workers conducted by Bassi and colleagues⁶⁹ in the early days of the pandemic in the hardest hit region in Italy showed that 39.8% of the respondents met the criteria for provisional PTSD. They posit that taking preemptive action to train and protect vulnerable health care worker categories as well as promoting positive mental health may help reduce the negative mental health impact of this pandemic and serve as a roadmap in allaying these effects in future disaster events.

TELEMEDICINE AND CORONAVIRUS DISEASE 2019

There were swift shifts to telemedicine in many health care systems with the announcements of lockdowns. Nonemergent procedures were canceled, and staff was diverted to frontline work when possible. Telemedicine was one of the bigger health care shifts during this pandemic.

Before the pandemic, Psychiatry was among the medical specialties that used telemedicine the most.⁷⁴ Changes in Centers for Medicare and Medicaid Services⁷⁵ regarding reimbursement and certain easing or waivers of legal restrictions allowed physicians in the United States to bill for telemedicine services on par with in-person visits. State health departments provided temporary licensing or waivers to physicians in nearby states to provide telemedicine services.

Geriatric psychiatrists and other geriatric clinicians were able to provide care while minimizing viral exposure to this particularly affected group of patients. Medical care was also possible for patients who were in quarantine via telemedicine services.

It should be noted that telemedicine is not a universal remedy. Other previously identified barriers to telemedicine, such as technological challenges for health care staff and patients, older age, rural setting, lack of equipment or outdated equipment, inadequate broadband services, and computer literacy, persisted.⁷⁶ Telemedicine has the potential to promote health equity and reduce health disparities but only if the current barriers are removed. It is telling that most of the research on telemedicine in older adults has been conducted in high-income countries.⁷⁷ The quick uptake in telemedicine usage in the United States during the COVID-19 pandemic was facilitated by policy changes on state and federal levels. In order to maintain the benefits we have seen from using telemedicine during the pandemic, long-term policy decisions and careful implementation that takes into account everyone involved are essential.

SUMMARY

The COVID-19 pandemic led to numerous changes in health care. As a newly defined disease, it brought with it a significant amount of apprehension about all the unknowns

regarding its origin, infectivity, transmission, susceptibility, as well as the long- and short-term outcomes associated with it. It has been learned that older adults and those with comorbid medical disorders, of which older adults also form a majority, have significantly higher morbidities and mortalities.³ This was especially true in long-term care facilities that were shown to have high rates of severe cases, hospitalization, and death.^{6,7}

Social isolation increased in the older adult population as a direct result of the mitigation strategies recommended by national disease control centers to help reduce infectivity rates. Social connectedness is important in maintaining health, improving quality of life, and reducing morbidity and mortality in older adults¹¹; with older adults accounting a quarter of all suicide deaths worldwide,¹⁸ implementing strategies that reduce social isolation will promote positive health outcomes. Studies looking at potential strategies for mass trauma interventions have recommended interventions that promote a sense of safety, calming, a sense of self and community efficacy, connectedness, and hope with many focusing on telehealth.²⁷ As with other health outcomes, the impact of social isolation during the COVID-19 pandemic has been worse in underserved older adult communities.

Physical inactivity resulting from lockdowns and other social distancing measures and malnutrition has directly contributed to an increase in disability in older adults. Anxiety about contracting the virus led many older adults to postpone routine screenings for chronic disorders or cancers, resulting in worse health outcomes. Older adults have also reported worse sleep¹⁴ and are more likely to have severe neurologic sequelae of the disease.⁴⁴

The increased caregiver stress during the pandemic resulted in an increase in physical and financial elder abuse.⁶⁴ Regrettably, this may be an underestimation of the true prevalence, as older adults with poor health conditions and limited resources were not included in the study.

Protecting the geriatric workforce is also an important part of caring for the older adult population. Health care workers have higher exposure to traumatic events with subsequently worse mental health outcomes.^{70,71} Reducing these negative outcomes requires protecting vulnerable health care worker categories, providing appropriate training for all health care workers, and promoting positive mental health.⁶⁹

The COVID-19 pandemic presented the health care field with the challenge of continuously adapting to the changing health care landscape while ensuring the provision of needed quality care for patients and support for the loved ones in their lives. In the United States, the rapid and widespread adoption of telemedicine was encouraged by key regulatory changes at federal and state levels.⁷⁵ Access to care remained inequitable, was exacerbated by the pandemic, and highlighted the already present and long-standing health disparities seen in racial, ethnic, and gender minority populations as well as in rural communities. Individual and systemic changes in addition to innovations in strategy and implementation will be critical in meeting the current and future mental health needs of all older adults.

CLINICAL PEARLS

- Long-term care facilities had high rates of severity and hospitalizations and accounted for more than 35% of deaths in the United States^{6,7} and 19% to 72% of deaths worldwide.⁵⁷
- Social connectedness is important in helping older adults maintain good health, improve quality of life, and reduce morbidity and mortality.¹¹
- There is a higher prevalence of anxiety, depression, and loneliness in older adults when compared with pre-pandemic levels.²⁵

- Older adults who reported social isolation were more likely to report increased alcohol consumption.²⁶
- Physical inactivity contributes significantly to disability and is the fourth highest risk factor for mortality in older adults.^{29,30}
- Older adults had significant decline in physical activity, and those that were hospitalized for any reason had even more severe physical effects.^{32,33}
- The postponement of routine surveillance for chronic disorders or cancers resulted in worse health outcome.
- Patients with more severe neurologic disease were more likely to be older.⁴⁴
- The COVID-19 pandemic highlighted chronic racial, ethnic, rural health care disparities.
- There was an 83.6% increase in elder abuse when compared with prepandemic levels.⁶⁴
- Health care workers had worse mental health outcomes in prepandemic times and only worsened with the pandemic.^{69–73}
- State and federal regulatory changes helped spur on the use of telemedicine during the pandemic.⁷⁵

RECOMMENDED INTERVENTIONS

Social Isolation: training in the use of available and new technologies¹³ as well as low-tech strategies, such as letter writing, phone calls, pet therapy.^{14–17}

Mental Health: telephone and video-based interventions are effective in the management of depression, anxiety, PTSD, and adjustment disorder.²⁸

Physical Health: walking, exercise games on video game consoles, interactive rehabilitation technologies, or exercise DVDs that require no Internet connection but do require a DVD player.^{32,34}

Elder Abuse: increased awareness and screening should be a regular part of the assessment of older adults in any health care setting.

Health Care Workers: training and protecting vulnerable health care worker categories and promoting positive mental health may help reduce negative mental health outcomes.⁶⁹

Systemic and Structural Changes: societal and structural changes, including providing more resources for at risk older adults and their families, policy updates and changes, infrastructure development.

REFERENCES

1. WHO coronavirus (COVID-19) dashboard. Available at: <https://covid19.who.int/>. August 14, 2021.
2. United States COVID-19 Cases, Deaths, and laboratory testing (NAATs) by state, territory, and jurisdiction. Available at: https://covid.cdc.gov/covid-data-tracker/#cases_casesper100klast7days. August 14, 2021.
3. Increased risk of hospitalization or death. Available at: <https://www.cdc.gov/coronavirus/2019-ncov/need-extra-precautions/older-adults.html>. June 5, 2021.
4. Cronin AM, Railey S, Fortune D, et al. Notes from the field: effects of the COVID-19 response on tuberculosis prevention and control efforts—United States, March–April 2020. *MMWR Morb Mortal Wkly Rep* 2020;69(29):971–2.
5. Centers for Disease Control and Prevention COVID-19 Response Team. Severe outcomes among patients with coronavirus disease 2019 (COVID-19)—United States, February 12–March 16, 2020. *MMWR Morb Mortal Wkly Rep* 2020; 69(12):343–6.

6. Grabowski DC, Mor V. Nursing home care in crisis in the wake of COVID-19. *J Am Med Assoc* 2020;324(1):23–4.
7. Yourish K, Lai KKR, Ivory D, et al. One-third of all U.S. coronavirus deaths are nursing home residents or workers. Available at: <https://www.nytimes.com/interactive/2020/us/coronavirus-nursing-homes.html>. June 13, 2021.
8. de Jong-Gierveld J, van Tilburg TG, Dykstra PA. Loneliness and social isolation. In: Perlman D, Vangelisti A, editors. *The Cambridge handbook of personal relationships*. Cambridge University Press; 2006. p. 485–500.
9. Peplau LA, Perlman D. Perspectives on loneliness. In: Peplau LA, Perlman D, editors. *Loneliness*. New York: Wiley; 1982. p. 1–18.
10. A national survey of adults 45 and older: loneliness and social connections. Available at: https://www.aarp.org/content/dam/aarp/research/surveys_statistics/life-leisure/2018/loneliness-social-connections-2018.doi.10.26419-2Fres.00246.001.pdf. June 13, 2021.
11. Steptoe A, Shankar A, Demakakos P, et al. Social isolation, loneliness, and all-cause mortality in older men and women. *Proc Natl Acad Sci U S A* 2013; 110(15):5797–801.
12. Holt-Lunstad J, Smith TB, Layton JB. Social relationships and mortality risk: a meta-analytic review. *PLoS Med* 2010;7(7):e1000316.
13. Rolandi E, Vaccaro R, Abbondanza S, et al. Loneliness and social engagement in older adults based in Lombardy during the COVID-19 lockdown: the long-term effects of a course on social networking sites use. *Int J Environ Res Public Health* 2020;17(21):7912.
14. Smith M, Steinman L, Casey EA. Combating social isolation among older adults in a time of physical distancing: the COVID-19 social connectivity paradox. *Front Public Health* 2020;8:403.
15. Gorenko J, Moran C, Flynn M, et al. Social isolation and psychological distress among older adults related to COVID-19: a narrative review of remotely-delivered interventions and recommendations. *J Appl Gerontol* 2021;40(1):3–13.
16. Jarvis M, Padmanabhanunni A, Balakrishna Y, et al. The effectiveness of interventions addressing loneliness in older persons: an umbrella review. *International Journal of Africa Nursing Sciences*, 12, Article 100177, 2020.
17. Gardiner C, Geldenhuys G, Gott M. Interventions to reduce social isolation and loneliness among older people: an integrative review. *Health Soc Care Community* 2018;26(2):147–57.
18. World Health Organization. Mental health of older adults. 2017. Available at: <https://www.who.int/en/news-room/fact-sheets/detail/mental-health-of-older-adults>. June 15, 2021.
19. Santini ZI, Jose PE, Cornwell EY, et al. Social disconnectedness, perceived isolation, and symptoms of depression and anxiety among older Americans (NSHAP): a longitudinal mediation analysis. *Lancet Public Health* 2020;5(1):e62–70.
20. Pieh C, Budimir S, Probst T. The effect of age, gender, income, work, and physical activity on mental health during coronavirus disease (COVID-19) lockdown in Austria. *J Psychosom Res* 2020;136:110186.
21. Czeisler MÉ, Lane RI, Petrosky E, et al. Mental health, substance use, and suicidal ideation during the COVID-19 pandemic — United States, June 24–30, 2020. *MMWR Morb Mortal Wkly Rep* 2020;69:1049–57.
22. González-Sanguino C, Ausín B, Castellanos M, et al. Mental health consequences during the initial stage of the 2020 coronavirus pandemic (COVID-19) in Spain. *Brain Behav Immun* 2020;87:172–6.

23. De Pue S, Gillebert C, Dierckx E, et al. The impact of the COVID-19 pandemic on wellbeing and cognitive functioning of older adults. *Sci Rep* 2021;11:4636.
24. Tyler CM, McKee GB, Alzueta E, et al. A study of older adults' mental health across 33 countries during the COVID-19 pandemic. *Int J Environ Res Public Health* 2021;18(10):5090.
25. Eastman M, Finlay J, Kobayashi L. Alcohol use and mental health among older American adults during the early months of the COVID-19 pandemic. *Int J Environ Res Public Health* 2021;18(8):4222.
26. Fernandez A, Kullgren J, Malani P, et al. Alcohol use among older adults. University of Michigan National Poll on Healthy Aging; 2021. Available at: 10.7302/1328. Accessed June 16, 2021.
27. Cheung YT, Chau PH, Yip PS. A revisit on older adults suicides and severe acute respiratory syndrome (SARS) epidemic in Hong Kong. *Int J Geriatr Psychiatry* 2008;23(12):1231–8.
28. Hobfoll SE, Watson P, Bell CC, et al. Five essential elements of immediate and mid-term mass trauma intervention: empirical evidence. *Psychiatry Interpersonal Biol Process* 2007;70(4):283–315.
29. Varker T, Brand RM, Ward J, et al. Efficacy of synchronous telepsychology interventions for people with anxiety, depression, posttraumatic stress disorder, and adjustment disorder: a rapid evidence assessment. *Psychol Serv* 2019;16(4): 621–35.
30. World Health Organization . WHO; Geneva: 2010. *Global Recommendations on Physical Activity for Health*. chap. 2.1.
31. Gomes M, Figueiredo D, Teixeira L, et al. Physical inactivity among older adults across Europe based on the SHARE database. *Age Ageing* 2017;46(1):71–7.
32. Goethals L, Barth N, Guyot J, et al. Impact of home quarantine on physical activity among older adults living at home during the COVID-19 pandemic: qualitative interview study. *JMIR Aging* 2020;3(1):e19007.
33. Yamada M, Kimura Y, Ishiyama D, et al. Effect of the COVID-19 epidemic on physical activity in community-dwelling older adults in Japan: a cross-sectional online survey. *J Nutr Health Aging* 2020;24(9):948–50.
34. Ortiz-Alonso J, Bustamante-Ara N, Valenzuela PL. Effect of a simple exercise programme on hospitalisation-associated disability in older patients: a randomised controlled trial. *J Am Med Dir Assoc* 2020;21:531–7.e1.
35. Barbosa Neves B, Franz R, Judges R. Can digital technology enhance social connectedness among older adults? A feasibility study. *J Appl Gerontol* 2019; 38:49–72.
36. Carvalho LP, Kergoat MJ, Bolduc A, et al. A systematic approach for prescribing posthospitalization home-based physical activity for mobility in older adults: the PATH Study. *J Am Med Dir Assoc* 2019;20:1287–93.
37. Cerri AP, Bellelli G, Mazzone A, et al. Sarcopenia and malnutrition in acutely ill hospitalized elderly: prevalence and outcomes. *Clin Nutr* 2015;34:745–51.
38. Niles MT, Bertmann F, Belarmino EH, et al. The early food insecurity impacts of COVID-19. *Nutrients* 2020;12:2096.
39. Batsis JA, Daniel K, Eckstrom E, et al. Promoting healthy aging during COVID-19. *J Am Geriatr Soc* 2021;69(3):572–80.
40. Zabetakis I, Lordan R, Norton C, et al. COVID-19: the inflammation link and the role of nutrition in potential mitigation. *Nutrients* 2020;12. <https://doi.org/10.3390/nu12051466>.

41. Gerlach L, Solway E, Singer D, et al. Mental health among older adults before and during the COVID-19 pandemic. University of Michigan National Poll on Healthy Aging; 2021. Available at: 10.7302/983. Accessed June 16, 2021.
42. Alhola P, Polo-Kantola P. Sleep deprivation: impact on cognitive performance. *Neuropsychiatr Dis Treat* 2007;3:553–67.
43. Liotta EM, Batra A, Clark JR, et al. Frequent neurologic manifestations and encephalopathy-associated morbidity in Covid-19 patients. *Ann Clin Transl Neurol* 2020;7:2221–30.
44. Mao L, Jin H, Wang M, et al. Neurologic manifestations of hospitalized patients with coronavirus disease 2019 in Wuhan, China. *JAMA Neurol* 2020;77(6):1-9.
45. Williamson E, Walker AJ, Bhaskaran KJ, et al. OpenSAFELY: factors associated with COVID-19-related hospital death in the linked electronic health records of 17 million adult NHS patients. *medRxiv* 2020;2020. 05.06.20092999.
46. Atkins JL, Masoli JA, Delgado J, et al. Preexisting comorbidities predicting severe COVID-19 in older adults in the UK biobank community cohort. *medRxiv* 2020;2020. 05.06.20092700.
47. Kuo CL, Pilling LC, Atkins JL, et al. APOE e4 genotype predicts severe COVID-19 in the UK biobank community cohort. *J Gerontol A Biol Sci Med Sci* 2020;75(11): 2231–2.
48. Graham G. Why your ZIP code matters more than your genetic code: promoting healthy outcomes from mother to child. *Breastfeed Med* 2016;11:396–7.
49. Sloggett A, Joshi H. Deprivation indicators as predictors of life events 1981-1992 based on the UK ONS Longitudinal Study. *J Epidemiol Community Health* 1998; 52(4):228–33.
50. Gorges RJ, Konetzka RT. Staffing levels and COVID-19 cases and outbreaks in U.S. nursing homes. *J Am Geriatr Soc* 2020;68(11):2462–6.
51. Weech-Maldonado R, Lord J, Davlyatov G, et al. High-minority nursing homes disproportionately affected by COVID-19 deaths. *Front Public Health* 2021;9: 606364.
52. Henning-Smith C. The unique impact of COVID-19 on older adults in rural areas. *J Aging Soc Policy* 2020;32(4–5):396–402.
53. Paul R, Arif A, Adeyemi O, et al. Progression of COVID-19 from urban to rural areas in the United States: a spatiotemporal analysis of prevalence rates. *J Rural Health* 2020;36(4):591–601.
54. Melvin S, Wiggins C, Burse N, et al. The role of public health in COVID-19 emergency response efforts from a rural health perspective. *Prev Chronic Dis* 2020; 17:E70.
55. Huyser K, Yang T, Yellow Horse A. Indigenous peoples, concentrated disadvantage, and income inequality in New Mexico: a ZIP code-level investigation of spatially varying associations between socioeconomic disadvantages and confirmed COVID-19 cases. *J Epidemiol Community Health* 2021;75(11):1044–9.
56. Schiff R, Buccieri K, Schiff JW, et al. COVID-19 and pandemic planning in the context of rural and remote homelessness. *Can J Public Health* 2020;111(6):967–70.
57. Thompson D, Barbu M, Beiu C, et al. The impact of COVID-19 pandemic on long-term care facilities worldwide: an overview on international issues. *Biomed Res Int* 2020;2020:8870249.
58. Schulz R, Sherwood P. Physical and mental health effects of family caregiving. *Am J Nurs* 2008;108(9 Suppl):23–7.
59. Taub A. A new COVID-19 crisis: domestic abuse rises worldwide. *The New York Times*; 2020. Available at: <https://www.nytimes.com/2020/04/06/world/coronavirus-domestic-violence.html>. June 14, 2021.

60. Sserwanja Q, Kawuki J, Kim J. Increased child abuse in Uganda amidst COVID-19 pandemic. *J Paediatr Child Health* 2021;57:188–91.
61. Mazza M, Marano G, Lai C, et al. Danger in danger: interpersonal violence during COVID-19 quarantine. *Psychiatry Res* 2020;289.
62. Makaroun L, Bachrach R, Rosland A. Elder abuse in the time of COVID-19—increased risks for older adults and their caregivers. *Am J Geriatr Psychiatry* 2020;28(8):876–80.
63. Pillemer K, Burnes D, Riffin C, et al. Elder abuse: global situation, risk factors, and prevention strategies. *Gerontologist* 2016;56(Suppl. 2):S194–205.
64. Chang E, Levy R. High prevalence of elder abuse during the COVID-19 pandemic: risk and resilience factors. *Am J Geriatr Psychiatry* 2021;29(11):1152–9.
65. Elman A, Breckman R, Clark S, et al. Effects of the COVID-19 outbreak on elder mistreatment and response in New York City: initial lessons. *J Appl Gerontol* 2020;39(7):690–9.
66. Ricci-Cabello I, Meneses-Echavez JF, Serrano-Ripoll MJ, et al. Impact of viral epidemic outbreaks on mental health of healthcare workers: a rapid systematic review. medRxiv 2020. <https://doi.org/10.1101/2020.04.02.20048892>.
67. Maunder RG, Lancee WJ, Balderson KE, et al. Long-term psychological and occupational effects of providing hospital healthcare during SARS outbreak. *Emerg Infect Dis* 2006;12:1924–32.
68. García-Fernández L, Romero-Ferreiro V, López-Roldán PV, et al. Mental health impact of COVID-19 pandemic on Spanish healthcare workers. *Psychol Med* 2020;1–6. <https://doi.org/10.1017/S0033291720002019>.
69. Bassi M, Negri L, Delle Fave A, et al. The relationship between post-traumatic stress and positive mental health symptoms among health workers during COVID-19 pandemic in Lombardy, Italy. *J Affect Disord* 2021;280(Pt B):1–6.
70. Sendler DJ, Rutkowska A, Makara-Studzinska M. How the exposure to trauma has hindered physicians' capacity to heal: prevalence of PTSD among healthcare workers. *Eur J Psychiatr* 2016;30:321–34.
71. Mealer M, Burnham EL, Goode CJ, et al. The prevalence and impact of post traumatic stress disorder and burnout syndrome in nurses. *Depress Anxiety* 2009;26:1118–26.
72. Kessler RC, Berglund P, Demier O, et al. Lifetime prevalence and age-of-onset distributions of DSM-IV disorders in the National Comorbidity Survey Replication. *Arch Gen Psychiatry* 2005;62:593–602.
73. Ouslander JG, Grabowski DC. COVID-19 in nursing homes: calming the perfect storm. *J Am Geriatr Soc* 2020;68(10):2153–62.
74. Robeznieks A. Which medical specialties use telemedicine the most? American Medical Association; 2019. Available at: <https://www.ama-assn.org/practice-management/digital/which-medical-specialties-use-telemedicine-most>. June 22, 2021.
75. Services CfMaM state Medicaid and CHIP telehealth toolkit - policy considerations for states expanding use of telehealth COVID-19 version. 2019. Available at: <https://www.medicaid.gov/medicaid/benefits/downloads/medicaid-chip-telehealth-toolkit.pdf>. June 22, 2021.
76. Scott Kruse C, Karem P, Shifflett K, et al. Evaluating barriers to adopting telemedicine worldwide: a systematic review. *J Telemed Telecare* 2018;24(1):4–12.
77. Doraiswamy S, Jithesh A, Mamtani R, et al. Telehealth use in geriatrics care during the COVID-19 pandemic—a scoping review and evidence synthesis. *Int J Environ Res Public Health* 2021;18(4):1755.