

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.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.

The Impact of Severe Acute Respiratory Syndrome-Coronavirus-2 Infection and Pandemic on Mental Health and Brain Function in the Elderly

Angela Wang, мо^а, Caitlin Lawrence, мо^{а,b,*}

KEYWORDS

COVID-19 • SARS-CoV-2 • Pandemic • Elderly • Geriatric

KEY POINTS

- Direct effects of COVID-19 infection on the elderly are likely a function of illness severity, pre-existing medical and psychaitric co-morbidities, and sociocultural context.
- COVID-19 infection in the elderly had the potential to influence symptoms of anxiety, depression, insomnia, cognition, and PTSD. Non-infected individuals faced grief, isolation, and loneliness.
- The wellbeing of geriatric patients and caregivers during the COVID-19 pandemic relates to the sweeping challenges in healthcare delivery and long term care services.
- Though vulnerable to the direct and indirect effects of the COVID-19 virus, older individuals have shown resilience.

INTRODUCTION

At the precipice of its third year, the coronavirus disease (COVID-19), as a pandemic, has destabilized the well-being of individuals across the globe, and in many ways has disproportionately affected the lives of the elderly. Severe acute respiratory syndrome-coronavirus-2 (SARS-CoV-2) was first recognized in China in late 2019 as a respiratory virus with broad systemic effects and a high potential for transmissibility and lethality, spreading quickly around the globe. The World Health Organization estimates over 6 million deaths related to COVID-19 worldwide,¹ and the Centers for Disease Control and Prevention has identified nearly 975,000 deaths in the United

Psychiatr Clin N Am 45 (2022) 611–624 https://doi.org/10.1016/j.psc.2022.07.007 0193-953X/22/© 2022 Elsevier Inc. All rights reserved.



^a Department of Psychiatry and Human Behavior, Warren Alpert Medical School, Brown University, Providence, RI, USA; ^b The Miriam Hospital, 164 Summit Avenue, Providence, RI 02906, USA

^{*} Corresponding author. The Miriam Hospital, 164 Summit Avenue, Providence, RI 02906. *E-mail address:* caitlin_lawrence@brown.edu

States,² over 75% in individuals over age 65. Early in the pandemic, the elderly were identified as vulnerable to severe complications and higher lethality rates. The wellbeing of the elderly has been a source of great concern, given the high morbidity and mortality, disruption in natural supports, sweeping social changes, and the implications of isolation precautions on these individuals. However, the elderly have long been appraised to have better emotional regulation, lower stress reactivity, and a greater sense of well-being than younger adults.³ Understanding the overall impact of the COVID-19 pandemic on the mental health and global well-being of the elderly remains complex and requires an appraisal of the direct effects of COVID-19 infection on individuals, as well as the psychological impact of public health measures, such as lockdown protocols intended to curb the spread of the virus. At the time of the publication of this article, the preponderance of published literature examines data in the early stages of the pandemic during a time of significant fear, confusion, and uncertainty; although ongoing research is underway to better understand the later stages of the pandemic after the development of effective vaccines and loosening of social restrictions.

CASE

Mr. J is an 81-year-old man who contacted the geriatric psychiatry clinic in June of 2020 at the urging of his children. He had previously been supported in the clinic for anxiety, insomnia, and caregiver stress related to the care of his wife, who suffered from moderate dementia and had recently transitioned to a memory unit at an assisted living facility in 2019. In the wake of the pandemic, he had been unable to visit his wife for the past 3 months due to isolation protocols and an outbreak of COVID-19 in the facility. Mrs. J eventually contracted the infection and suffered from weakness, lethargy, and dehydration, requiring multiple hospitalizations and transitions to skilled nursing facilities. She had declined by this point and was minimally verbal and with a higher degree of baseline confusion, but had survived the infection. Mrs. J remained weak and unable to progress out of the nursing home, and the couple was only able to communicate during brief and infrequent phone calls, and the interactions were quite limited. Mr. J remained healthy but had been isolated at home for the past 3 months. His children limited any in-person interactions due to their wishes to avoid exposing him to the virus. Mr. J was now suffering from an increasingly depressed mood and anxiety in the wake of separation and uncertainty about his wife's trajectory. He was still able to manage his own cooking and cleaning but his children had provided assistance for grocery deliveries. He was able to connect for his telehealth visit, although troubleshooting his video conference took nearly 20 minutes, and effective communication was limited by his profound hearing impairment.

How can you understand the direct and indirect effects of the COVID-19 pandemic on Mr. J and Mrs. J?

What interventions for addressing Mr. J's symptoms were feasible at this time? How may this have changed as the pandemic progressed?

DIRECT NEUROPSYCHIATRIC EFFECTS OF CORONAVIRUS DISEASE INFECTION

Neurological symptoms of SARS-CoV-2 infection were recognized early in the pandemic and are a source of immediate concern and academic interest. Case reports of a broad spectrum of acute COVID-related neurologic events included ischemic stroke, encephalitis, epilepsy, neurodegenerative diseases, and inflammatory-mediated neurological disorders.⁴ Mediators in such cases are hypothesized to include the direct neurotrophic effects of COVID-19, as well as indirect

effects of hospitalization, hypoxia, use of mechanical ventilation and sedatives, systemic inflammation, and organ dysfunction.⁵ Across age groups, in the early stages of the pandemic, hospitalized adults experienced high rates of COVID-related delirium⁶; and elderly patients who experienced COVID-related delirium were found to be at higher risk of subsequent longer-term cognitive decline.⁷ The capability of COVID-19 to invade the blood-brain barrier, exhibit direct neurotrophic effects on the central nervous system, and directly contribute to cardiovascular and cerebrovascular disease is theorized to place the elderly population at higher longer-term risk of cognitive decline, dementia, and even motor impairment.⁸

These concerns are only a superficial summary of a larger and evolving evidence base. Neuropsychiatric effects of COVID-19 infection in the elderly are covered extensively elsewhere in this issue by Roy and Dix.

OUTCOMES OF CORONAVIRUS DISEASE INFECTION ON THE PSYCHIATRIC HEALTH OF ELDERLY INDIVIDUALS

Elderly individuals were psychologically impacted by the pandemic in different ways than their younger counterparts. In the general population, the elderly appeared more likely to express fear of COVID-19 than younger individuals, but globally had a lesser degree of psychological impact related to the pandemic and were considered to be a generally more resilient group.^{9–11} However, patients who have experienced COVID-19 infections appear uniquely vulnerable to psychological symptoms compared to noninfected individuals.¹²

Research involving adult COVID-19 survivors may help guide understanding of the direct psychological effects of COVID-19 infection on the elderly, but further efforts to distinguish these two populations are necessary. One study of over 40,000 adult patients in a global health collaborative clinical research database identified a number of common psychiatric manifestations of coronavirus infection, the most prevalent being anxiety and related disorders in 4.6%, mood disorders in 3.8%, sleep disorders in 3.4%, and even suicidal ideation in 0.2%.¹³ Survivors of COVID-19 are found in short-term follow-up studies to have prominent symptoms of anxiety, depression, fatigue, and insomnia,^{14,15} also reflected in the persistence of elevated PHQ-9 scores 2–3 months after hospital discharge.¹⁶ Studies up to 6-months post-infection reveal symptoms of anxiety and/or depression in 23% of participants and sleep difficulties in 26%.¹⁷ Rates of depression in COVID-19 survivors were significantly higher than those of noninfected individuals affected by quarantine and isolation precautions.¹⁸

Studies specifically examining elderly COVID-19 survivors suggest that the elderly are vulnerable to psychological symptoms, especially after severe infections. In one study of hospitalized elderly COVID-19 survivors, 11.5% were identified to have clinically significant symptoms of anxiety and 46.2% to have clinically significant symptoms of depression.¹⁹ In a small study of 69 elderly individuals 2-weeks posthospital discharge, multiple measures of psychiatric well-being were astonishingly elevated in COVID-19 survivors when compared with age-matched healthy residents in the community—with 100% of survivors showing pathological scores in a measure of global mental health, 93.2% with symptoms of anxiety, and 86.6% with symptoms of depression.²⁰ A recent cohort study of 215 residents of long-term care facilities in Spain during the early stages of the pandemic identified that elderly residents, regardless of the presence or absence of initial COVID-19 infection, experienced growth rates of psychiatric symptoms at 3-month follow-up, including symptoms of depression (57.7%), anxiety (29.3%), post-traumatic stress disorder (PTSD) (19.1%), and

sleep disturbance (93%); although this trend was true regardless of COVID-19 infection, those who had tested positive for COVID-19 at baseline experienced higher rates of anxiety and PTSD compared to their noninfected peers.²¹

Estimates of the incidence of PTSD symptoms in adult COVID-19 survivors are variable between studies and may be moderated by time relative to infection, the severity of infection, hospitalization, as well as the social context of the infection. One survey of clinically stable hospitalized adult COVID-19 survivors in the very early stages of the pandemic in Wuhan, China found that 96.2% had a significant degree of PTSD-spectrum symptoms on the day of hospital discharge,²² although these would be better classified as acute stress symptoms. However, 4 months posthospital discharge, a study of 238 COVID-19 survivors in Italy identified mild symptoms of PTSD in 25.6%, moderate symptoms in 11.3%, and severe PTSD symptoms in 5.9%.²³

However, Horn and colleagues²⁴ studied patients in France with laboratoryconfirmed COVID-19 infection 2 months after infection and reported that rates of clinically probable PTSD were significantly lower in patients over 60 years of age with laboratory-confirmed COVID-19 infection when compared with younger patients. Cai and colleagues¹⁹ also found that individuals who were retired or over 60 years old had a lesser degree of PTSD symptoms associated with recent COVID-19 infection when compared with younger infected individuals and that social support appeared to be a protective factor against the development of PTSD symptoms. Some hypothesize that the elderly, despite their vulnerability to the virus, may be more able to contextualize the relative impact of the virus to other traumatic and stressful events experienced earlier in life.

Longer-term sequelae of COVID-19 infections persisting beyond 12 weeks postinfection are often referred to as "long COVID," "long-haul COVID," "chronic COVID," "post-acute COVID-19," and a variety of other terms. Ongoing research is needed to define and study this phenomenon, which according to the CDC, includes neuropsychiatric symptoms, such as fatigue, mood changes, sleep changes, and cognitive changes often described as "brain fog."²⁵ A systematic review by Reynaud-Charest and colleagues.²⁶ examined a number of studies 12+ weeks after COVID-19 infection. Their summarized interpretations suggested that data on older age as a moderator of post-COVID depressive symptoms are mixed, that severity of acute COVID-19 infection did not clearly influence persistent depressive symptoms after COVID 19 infection, and that neurocognitive impairment did not clearly influence depression. However, the presence of post-COVID depressive symptoms did significantly impair neurocognitive function.

The phenomenon of post-COVID psychosis remains a topic of discussion in case studies and case series, with little data involving the elderly, and should be interpreted in the context of the relatively high incidence of COVID-related encephalopathy and neurologic sequelae in this age group.

Not only is there concern that COVID-19 infection increased the risk of poor psychiatric outcomes in the elderly, but there is clear evidence that poor psychological health increased the risk of poor outcomes of COVID-19 infection. A Cochrane review of 21 studies, including data from 91 million individuals revealed that those with pre-existing mood disorders had higher odds of COVID-19-related hospitalizations (odds ratio 1.31) and death (odds ratio 1.51) when compared with those without pre-existing mood disorders.²⁷ This is hypothesized to relate to the higher rates at which individuals with mood disorders reside in congregate facilities, experience comorbid health conditions, or possibly the increased risk of inflammatory states in those with certain mood disorders.

THE INDIRECT EFFECTS OF CORONAVIRUS DISEASE ON GERIATRIC MENTAL HEALTH

Even in elderly individuals who have been fortunate enough to avoid SARS-CoV-2 infection, the indirect effects of the global pandemic on mental health and overall well-being deserve recognition. The interaction between society and the pandemic has just as much influence on geriatric mental health as the virus has on the body. The policies enacted by governing bodies around the world to combat the pandemic and their cascading effects are the most apparent indirect influences of the virus. Although jurisdictions worldwide enacted different sets of public health protocols to control viral spread, public health information campaigns, quarantine, and masking orders were relatively pervasive.

Changes in residential care, homecare, and family care

The COVID-19 pandemic had a profoundly negative impact on resources for elderly adults both in the community and in residential care settings. Indirectly, barriers to obtaining optimal supportive services placed stress on both older adults and their caregivers, contributing to suboptimal global well-being and a greater risk of poor mental health outcomes.

Adults over age 65 comprise 62.5% of adult day care utilizers, 81.9% of home health agency utilizers, 81.5% of nursing home residents, and 93.4% of residential care community residents.²⁸ Infections in congregate care settings spread rapidly in the early pandemic, and although case reporting was imperfect at the time and often difficult to interpret, residents in nursing home settings comprised a large proportion of COVID-19-related infections and deaths. For example, one report in May 2020 suggested that at this 2-month mark in the pandemic, 42% of deaths in the United States from COVID-19 had stemmed from the 0.6% of the population residing in a nursing home and assisted living facilities.²⁹ As of March 31, 2022, there were 1,011,780 confirmed cases of COVID-19 and 151,726 COVID-19-related deaths in nursing home residents in the United States.³⁰

During the early waves of the pandemic, nursing homes were challenged to care for an unprecedented number of acutely ill patients in uncertain circumstances, finding it difficult to meet the needs of residents in accordance with usual quality standards. Front line nursing home staff noted multiple unique stressors impeding day-to-day care, including constraints on testing, extended use and reuse of personal protective equipment (PPE), appraising and implementing guidance from numerous regulatory agencies, increased workloads, staffing shortages, and the breakdown of organizational communication and teamwork. These practical challenges were coupled with the emotional burden of caring for residents facing isolation, severe illness, and death. Front line staffs reported increasing levels of burnout and also were demoralized by negative media coverage of nursing homes in comparison to the heroic efforts of hospital staff.³¹ Nationwide, the number of nursing home staff COVID-19 infections marginally exceeded those of nursing home residents, and as of March 31, 2022, there have been 2341 staff deaths related to COVID-19 (https://data.cms.gov). Infections to the staff perpetuated burnout and drastically disrupted the continuity of care of patients in all facility settings.

For residents of congregate care settings, a paucity of PPE and vaccinations translated to extreme measures to curb the spread of coronavirus. Elderly residents were placed in "lockdown" or "isolation" arrangements, were unable to see their families, and were unable to participate in shared meals or activities. The lack of access to surveillance testing perpetuated restrictions for months.³² The development and implementation of coronavirus vaccines drastically reduced the risk of mortality in congregate care settings and allowed for a stepwise reinstitution of community meals, stimulating group activities, and family visitation. However, COVID-19 exposures in long-term care settings continued to disrupt normal operations, including episodic lock-downs and slowing of admissions, making it difficult for patients in need of residential care to access such in a timely manner. Many families continued to experience a hesitancy to utilize congregate care environments. In these circumstances, the care of the elderly fell increasingly into the hands of family caregivers and home care agencies.

Access to adult daycare programs was uniquely disrupted during the pandemic, with a preponderance of programs closing entirely. Many elderly adults rely upon these programs for daytime structure, stimulating activities, access to basic nursing care, safe observation, and socialization. These needed services are essentially impossible to replicate in a home care environment. Closures and avoidance of adult day programs shifted responsibilities for care to in-home care and especially to informal family care internationally.^{33,34} However, home care agencies were also strained during the pandemic, and often unable to match the needs of the elderly in the community. One study in Japan suggested that home care service utilization did not increase during the pandemic, despite encouragement by the Japanese government.³⁵ Home care service providers were financially strained and unable to grow during the pandemic, due to declines in referrals, the high cost of necessary supplies, and furloughs.³⁶

Family caregivers were encouraged to implement a number of strategies to increase stimulation for recently homebound elderly individuals, including utilization of digital devices for social connection and stimulation, engaging in purposeful activities around the home, and developing a simple and predictable daily routine.³⁷ A small study involving spousal and adult-child caregivers of patients with dementia who received telephone support for family caregiving during the pandemic identified multiple sources of anxiety for caregivers, including the sense of isolation, increased responsibility, stress related to worsening dementia-related behaviors, restrictions of social interaction, concerns about job loss, and difficulties in adapting to COVID-19 safety recommendations.³⁸ Unfortunately, a sample of 897 community-dwelling older persons in the United States during the first 3 months of the pandemic identified reports of elder abuse in 21.3%, when compared with a 10% prepandemic baseline prevalence, with a sense of community appearing protective, although financial strain being associated with an increased risk of abuse.³⁹

Adult day programs have slowly become more accessible when compared with the early pandemic, but are still limited and prone to unpredictable closures.

Isolation and other downstream effects of quarantine

Successful quarantining inherently and deliberately leads to isolation, the explicit goal being to seclude individuals so that person-to-person transmission is limited. Surveys around the world have reflected broad increases in the rates of loneliness, depression, and anxiety as a result of this isolation, and the risks of suicide and suicidality have risen accordingly.⁴⁰ Geriatric patients living at home often reported a decrease in physical activity, increase in fatigue and hopelessness.⁴¹

Although the vast majority of surveys concluded a measurable increase in loneliness, depression, and anxiety, there were a small number of studies that examined this from different perspectives that seemed somewhat more optimistic. One survey in Qatar compared older adults to the gender and age-matched controls and found that the prevalence of depressive, anxiety, and stress scores in the elderly were not significantly different.⁴² However, in the quarantine group, higher depressive, anxiety, and stress scores as well as lower resilience was associated with the female gender. An Austrian survey comparing prepandemic and pandemic levels of loneliness found that although COVID-19 restrictions did result in increased levels of loneliness in the elderly, the effects were short-lived.⁴³ They concluded that they expect no strong negative consequences for mental health, although longitudinal studies are clearly needed.

An unintended consequence of specifically targeted quarantining policies was observed in Sweden.⁴⁴ As COVID-19 cases initially rose, the Public Health Agency in Sweden strongly advised avoiding contact with those aged 70 and above as a means to protect those deemed "weak and frail." Verbal abuse toward Swedish elderly for walking outside increased thought due to disparity in the restriction guide-lines based on age.

Interventions were made in an attempt to reduce social isolation and loneliness while still being physically apart. Intuitively, direct communication through social networking websites was associated with reduced loneliness, whereas passive engagement was associated with greater loneliness.⁴⁵ Flexibility in the delivery of both loneliness and psychological interventions with cognitive behavioral therapy improved benefit. The elderly also often reported the importance of traditional communication methods, such as telephone calls. Involvement of the elderly in befriending programs demonstrated increases in self-confidence, allowing volunteers to give back to their community and benefit from social engagement. A cross-sectional study from Hong Kong showed that the elderly who continued to volunteer during the pandemic experienced fewer symptoms of depression and anxiety, suggesting that encouragement of volunteerism despite difficult circumstances can promote mental health.⁴⁶

Grief

Owing to the higher mortality rates among the elderly, we may presume greater rates of catastrophic grief as the elderly lose friends, family, and loved ones at such an unnaturally accelerated rate. There have been countless stories of those who have died alone due to social distancing requirements, with families and friends unable to say goodbye in person. Normal bereavement processes and the social and cultural rituals they require have been universally disrupted almost without exception. The expectation was that rates of prolonged grief disorder among the elderly would naturally increase as a result.⁴⁷ A cross-sectional survey not limited to the elderly did note that where there were higher grief levels after COVID-19 bereavement than natural bereavement, grief severity was not significantly different pre- and post-pandemic. However, experiencing a loss during the pandemic elicited a more severe acute grief reaction.⁴⁸

Personal Protective Equipment and Communication

Sensory impairments, such as reduced visual and aural acuity, are most common in the geriatric population, who are also most likely to depend on the use of hearing aids, medical equipment, and compensatory strategies, such as lip-reading to function optimally. Widespread use of PPE during the pandemic has exacerbated the existing sensory and comprehension obstacles that the elderly face when communicating with family, friends, and service providers. Barriers to effective communications can negatively impact an individual's ability to confidently maintain meaningful social connections and express his or her needs effectively, hence contributing to loneliness, anxiety, disorientation, and distress.

Providers and caregivers are encouraged to implement pragmatic strategies for mindful communication during COVID-19. This may include approaching a patient from the front, giving time for older adults to process who you are, interacting at eye level, projecting a calm attitude, using short simple sentences, and emphasizing those sentences with gestures.⁴⁹

Reactions to public health announcement and media campaigns

Public health information campaigns have been an invaluable instrument for disseminating information about COVID-19, announcing new policies and procedures, and issuing recommendations on best practices. An information campaign that fails to convey the severity of the pandemic would induce a low level of arousal and in turn less action toward protecting oneself against the threat. At the other extreme, hyperbolic messaging may induce excessive stress and feelings of being overwhelmed, also leading to inadequate response to a threat.

Owing to the heightened morbidity and mortality in the geriatric population after COVID-19 infection, there was specific messaging in informational campaigns and in the media emphasizing the risk of the virus to the elderly,⁵⁰ which has persisted late into the pandemic.⁵¹ Although this message was intended to protect a more vulnerable generation, this repetitive reminder throughout the pandemic also emphasized the frailty of old age and may have had the unintended consequence of framing the elderly as a burden or a liability. Although drawing on data that is accurate in that the elderly are more at risk, the framing continues to divide the young and the old. So-cial media carried more blatant ageist sentiments. During a time when more individuals relied on social media to feel connected during quarantine, user-generated metadata terms such as "#BoomerRemover" trended on the popular microblogging site Twitter.⁵² This collected and disseminated ageist messages and became a platform for expressions of intergenerational resentment.

Racial inequality and violence

The COVID-19 death rate in the United States has disproportionately consisted of Non-Latino Black and Latino Americans,53 which was most prominent in middleaged adults but persisted into the 9th decade. These findings brought essential attention to sources of structural racism within these communities, noting higher rates of employment in "essential" positions, employment without paid sick leave, and living arrangements in densely populated areas or multigenerational homes.⁵⁴ Although living in close proximity to family caregivers was once a protective factor for wellbeing in these families, it became an unavoidable risk. Similar influences directly contributed to increased COVID-19 mortality and barriers to care among older Asian Americans.⁵⁵ The organization Stop Asian American and Pacific Islander (AAPI) Hate gathered data on racially motivated attacks on this group during the first year of the pandemic-of the 10,905 hate incidents reported, seniors were involved in up to 7%.⁵⁶ The National Public Radio report on the US census survey found that Asian American households were twice as likely as white households to report food scarcity at home during the pandemic due to fear of going out⁵⁷; in some locales, community organizations were able to respond to this need with meal delivery, but it is more likely that the elderly with baseline difficulties accessing services were left to manage on their own, perpetuating fear and uncertainty.

Telehealth and access to care

In the early stages of the pandemic, the shift to telemedicine services utilizing webbased videoconferencing platforms or telephone support allowed otherwise isolated individuals to have some connection to medical and psychiatric care. Given the nature of mental health care, psychiatry was uniquely poised for a transition to telehealth services, providing access to care with minimal risk of viral exposure. Although this rapid innovation was helpful to many, the infrastructure to support this shift was not available in many lower resource countries and was often not sufficient in caring for elderly individuals with cognitive limitations.⁵⁸ Low computer literacy, poor Internet access, cognitive limitations, and sensory impairment remain barriers to the universal implementation and usefulness of telemedicine services for a substantial portion of this demographic. Although a number of modifications were made to cognitive evaluation tools to allow for virtual assessment, thorough cognitive assessments remained difficult to implement in a telehealth format. With waning in the perceived acuity of the pandemic and widespread availability of effective vaccinations and appropriate PPE, the availability of in-person care is again normalizing.

SUMMARY AND IMPLICATIONS FOR PRACTICE

Thoughtful assessment of elderly individuals will be essential for helping this cohort heal, recover, and adapt to the pandemic. This will include screening for prior COVID infection, assessing the severity of the prior infection and any short- or long-term neurocognitive effects of infection, assessing for the presence or worsening of psychiatric symptoms, appraising available social supports and changes in social engagement, identifying needs that were not met during pandemic restrictions and if these have been subsequently remedied, identifying loss and grief, and assessing for the appropriateness of in-person support versus utilization of telehealth to increase access to quality care.

Ongoing research will be essential in helping to better understand shifts in the cognitive, psychiatric, and physical health of elderly individuals during the later waves of the pandemic, and the impact of vaccination and other public health interventions on these domains.

The demand for geriatric psychiatry will grow even more precipitously in a late pandemic and post-pandemic world, and large-scale efforts to address this resource gap will be essential for the health of our communities **Boxes 1** and **2**.

Box 1

Potential components of a biopsychosocial survey of the elderly adult in the COVID-19 pandemic

- Prepandemic cognitive impairment, mental health diagnoses, and social vulnerabilities
- Before COVID-19 infection and subsequent challenges
 - Cognitive
 - Psychologic (mood, anxiety, sleep, PTSD)
 - Physical (frailty, deconditioning, falls, weight loss, worsening in medical comorbidities)
- Changes in residential circumstances
 Hospitalizations, nursing homes, homecare, family care
- Changes in financial circumstances
 - $\circ\,$ Job loss, premature retirement, caregiver job loss
- Recent experiences of grief and loss
- Recent experiences of racial bias, social inequity, caregiver abuse or neglect
- Access to and quality of social supports and disruptions during pandemic
- Difficulty accessing resources
 - Transportation
 - Senior center, adult day services
 - Food
 - Medical appointments, medications, diagnostic studies
- Ability to participate effectively in telehealth services

Box 2

Potential resources for a transdisciplinary approach to support resilience in the elderly adult during the COVID-19 pandemic

Social work

Physical therapy

Occupational therapy

Neurology

Neuropsychology

Primary care

Geriatric psychiatry

Psychotherapy

Grief support

Geriatric care management

Caregiver support programs

Elderly protective services

Exercise programs

Reopening community services (senior centers, adult day programs, and so forth)

Volunteer opportunities

CLINICAL PEARLS

- The direct effects of severe acute respiratory syndrome coronavirus virus 2 infection in the elderly include cognitive dysfunction, anxiety, depression, insomnia, and trauma-related symptoms, although the extent to which these are disruptive is likely a function of the severity of infection, the presence of pre-existing medical and psychiatric comorbidities, and the sociocultural context of the infection.
- Sociocultural shifts during the coronavirus disease (COVID-19) pandemic generated unprecedented challenges for even noninfected individuals, relating to grief, isolation, loneliness, discrimination, and barriers to meeting basic needs.
- The COVID-19 pandemic drastically impacted the delivery of care for individuals dependent on long-term care facilities, homecare services, and adult day services, shifting the burden of care to family caregivers.
- Although older adults have experienced poor outcomes relating to cognitive health and mental health during the pandemic, they have also shown a greater degree of resilience compared to younger adults, especially in consideration of post-traumatic or acute stress symptoms.
- Providers will continue to proactively support the physical, psychological, and social health of geriatric adults affected by the COVID-19 pandemic, including screening for and treating psychiatric symptoms; assessing for cognitive dysfunction; identifying unmet day-to-day needs; promoting vaccination; and supporting a safe return to valued activities and social relationships.
- The pandemic provided the catalyst for the expansion of telehealth services in geriatric psychiatry, although in-person services remain necessary to care for the most vulnerable.

DISCLOSURE

The authors have nothing to disclose.

REFERENCES

- 1. WHO coronavirus (COVID-19) dashboard. Available at: https://covid19.who.int/. Accessed March 28, 2022.
- Covid Data Tracker: 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. Accessed March 28, 2022.
- Lee EE, Depp C, Palmer BW, et al. High prevalence and adverse health effects of loneliness in community-dwelling adults across the lifespan. Int Psychogeriatr 2019;31(10):1447–62.
- 4. Achar A, Ghosh C. Covid-19-associated neurological disorders: the potential route of cns invasion and blood-brain relevance. Cells 2020;9(11):E2360.
- 5. Alonso-Lana S, Marquié M, Ruiz A, et al. Cognitive and neuropsychiatric manifestations of covid-19 and effects on elderly individuals with dementia. Front Aging Neurosci 2020;12:588872.
- 6. McIoughlin BC, Miles A, Webb TE, et al. Functional and cognitive outcomes after COVID-19 delirium. Eur Geriatr Med 2020;11(5):857–62.
- 7. Liu YH, Wang YR, Wang QH, et al. Post-infection cognitive impairments in a cohort of elderly patients with COVID-19. Mol Neurodegener 2021;16(1):48.
- 8. de Erausquin GA, Snyder H, Carrillo M, et al. The chronic neuropsychiatric sequelae of COVID-19: The need for a prospective study of viral impact on brain functioning. Alzheimers Dement 2021;17(6):1056–65.
- 9. Parlapani E, Holeva V, Nikopoulou VA, et al. A review on the COVID-19-related psychological impact on older adults: vulnerable or not? Aging Clin Exp Res 2021;33(6):1729–43.
- Palgi Y, Shrira A, Ring L, et al. The loneliness pandemic: loneliness and other concomitants of depression, anxiety and their comorbidity during the COVID-19 outbreak. J Affect Disord 2020;275:109–11.
- 11. Gonzalez-Sanguino C, Ausín B, Castellanos MÁ, 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.
- Krishnamoorthy Y, Nagarajan R, Saya GK, et al. Prevalence of psychological morbidities among general population, healthcare workers and COVID-19 patients amidst the COVID-19 pandemic: A systematic review and meta-analysis. Psychiatry Res 2020;293:113382.
- 13. Nalleballe K, Reddy Onteddu S, Sharma R, et al. Spectrum of neuropsychiatric manifestations in COVID-19. Brain Behav Immun 2020;88:71–4.
- 14. Mazza MG, De Lorenzo R, Conte C, et al. Anxiety and depression in COVID-19 survivors: Role of inflammatory and clinical predictors. Brain Behav Immun 2020;89:594–600.
- **15.** Townsend L, Dyer AH, Jones K, et al. Persistent fatigue following SARS-CoV-2 infection is common and independent of severity of initial infection. PLoS One 2020;15(11):e0240784.
- Raman B, Cassar MP, Tunnicliffe EM, et al. Medium-term effects of SARS-CoV-2 infection on multiple vital organs, exercise capacity, cognition, quality of life and mental health, post-hospital discharge. EClinicalMedicine 2021;31:100683.

- 17. Huang C, Huang L, Wang Y, et al. 6-month consequences of COVID-19 in patients discharged from hospital: a cohort study. Lancet 2021;397(10270):220–32.
- 18. Zhang J, Lu H, Zeng H, et al. The differential psychological distress of populations affected by the COVID-19 pandemic. Brain Behav Immun 2020;87:49–50.
- Cai X, Hu X, Ekumi IO, et al. Psychological distress and its correlates among COVID-19 survivors during early convalescence across age groups. Am J Geriatr Psychiatry 2020;28(10):1030–9.
- 20. Mowla A, Ghaedsharaf M, Pani A. Psychopathology in elderly covid-19 survivors and controls. J Geriatr Psychiatry Neurol 2022;35(4):467–71.
- Cortés Zamora EB, Mas Romero M, Tabernero Sahuquillo MT, et al. Psychological and functional impact of covid-19 in long-term care facilities: the covid-a study. Am J Geriatr Psychiatry 2022;30(4):431–43.
- 22. Bo HX, Li W, Yang Y, et al. Posttraumatic stress symptoms and attitude toward crisis mental health services among clinically stable patients with COVID-19 in China. Psychol Med 2021;51(6):1052–3.
- 23. Bellan M, Soddu D, Balbo PE, et al. Respiratory and psychophysical sequelae among patients with COVID-19 four months after hospital discharge. JAMA Netw Open 2021;4(1):e2036142.
- Horn M, Wathelet M, Amad A, et al. Prevalence and risk factors of ptsd in older survivors of covid-19 are the elderly so vulnerable? Am J Geriatr Psychiatry 2022; 30(6):740–2.
- 25. Post-covid conditions. Available at: https://www.cdc.gov/coronavirus/2019-ncov/ long-term-effects/index.html. Accessed March 28, 2022.
- 26. Renaud-Charest O, Lui LMW, Eskander S, et al. Onset and frequency of depression in post-COVID-19 syndrome: A systematic review. J Psychiatr Res 2021;144: 129–37.
- Ceban F, Nogo D, Carvalho IP, et al. Association between mood disorders and risk of covid-19 infection, hospitalization, and death: a systematic review and meta-analysis. JAMA Psychiatry 2021;78(10):1079–91.
- 28. Harris-Kojetin L, Sengupta M, Lendon JP, et al. Long-term care providers and services users in the United States, 2015–2016. National Center for Health Statistics. Vital Health Stat 2019;3(43).
- Roy A. The most important coronavirus statistic: 42% of U. S. deaths are from 0.6% of the population. Forbes. Retrieved from: https://www.forbes.com/sites/ theapothecary/2020/05/26/nursing-homes-assisted-living-facilities-0-6-of-the-us-population-43-of-u-s-covid-19-deaths/?sh=66dd2c4774cd. May 26, 2020.
- 30. Centers for Medicare and Medicaid Services. COVID-19 Nursing Home Data. Available at: https://data.cms.gov/covid-19/covid-19-nursing-home-data. Accessed March 28, 2022.
- **31.** White EM, Wetle TF, Reddy A, et al. Front-line nursing home staff experiences during the covid-19 pandemic. J Am Med Dir Assoc 2021;22(1):199–203.
- 32. Grabowski DC, Mor V. Nursing home care in crisis in the wake of covid-19. JAMA 2020;324(1):23–4.
- Dawson WD, Ashcroft EC, Lorenz-Dant K, et al. 2020. Mitigating the Impact of the COVID-19 Outbreak: A Review of International Measures to Support Community-Based Care.
- 34. Rodrigues R, Simmons C, Schmidt AE, et al. Care in times of COVID-19: the impact of the pandemic on informal caregiving in Austria. Eur J Ageing 2021; 18(2):195–205.
- **35.** Sugawara S, Nakamura J. Long-term care at home and female work during the COVID-19 pandemic. Health Policy 2021;125(7):859–68.

- **36.** Jones CD, Bowles KH. Emerging challenges and opportunities for home health care in the time of covid-19. J Am Med Dir Assoc 2020;21(11):1517–8.
- Canevelli M, Bruno G, Cesari M. Providing simultaneous covid-19-sensitive and dementia-sensitive care as we transition from crisis care to ongoing care. J Am Med Dir Assoc 2020;21(7):968–9.
- Lee J-A, Ju E, Tom C, et al. Telephone support for dementia family caregivers during the COVID-19 pandemic: Experiential differences in spouse and adult-child caregivers. Alzheimer's Dement 2021;17:e053244.
- **39.** Chang ES, Levy BR. High prevalence of elder abuse during the covid-19 pandemic: risk and resilience factors. Am J Geriatr Psychiatry 2021;29(11): 1152–9.
- Wand A, Zhong B, Chiu H, et al. COVID-19: the implications for suicide in older adults. Int Psychogeriatr 2020;32(10):1225–30.
- **41.** Yurumez Korkmaz B, Gemci E, Cosarderelioglu C, et al. Attitudes of a geriatric population towards risks about COVID -19 pandemic: in the context of anxiety and depression. Psychogeriatrics 2021;21(5):730–7.
- 42. Ouanes S, Kumar R, Doleh E, et al. Mental Health, resilience, and religiosity in the elderly under COVID-19 quarantine in Qatar. Arch Gerontol Geriatr 2021;96: 104457.
- **43.** Stolz E, Mayerl H, Freidl W. The impact of COVID-19 restriction measures on loneliness among older adults in Austria. Eur J Public Health 2020;31(1):44–9.
- 44. Skoog I. COVID-19 and mental health among older people in Sweden. Int Psychogeriatr 2020;32(10):1173–5.
- 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 2020; 40(1):3–13.
- **46.** Chan W, Chui C, Cheung J, et al. Associations between Volunteering and Mental Health during COVID-19 among Chinese Older Adults. J Gerontol Soc Work 2021;64(6):599–612.
- 47. Goveas J, Shear M. Grief and the COVID-19 Pandemic in Older Adults. FOCUS 2021;19(3):374–8.
- **48.** Eisma M, Tamminga A. Grief Before and During the COVID-19 Pandemic: Multiple Group Comparisons. J Pain Symptom Manage 2020;60(6):e1–4.
- **49.** Schlögl M, A. Jones C. Maintaining our humanity through the mask: mindful communication during COVID -19. J Am Geriatr Soc 2020;68(5):E12–3.
- **50.** Su Z, McDonnell D, Wen J, et al. Mental health consequences of COVID-19 media coverage: the need for effective crisis communication practices. Globalization and Health 2021;17(1).
- Leonhardt D. Covid's Risk to Older Adults. Nytimes.com. 2022. Available at: https://www.nytimes.com/2021/12/23/briefing/covids-risk-to-older-adults.html. Accessed March 20, 2022.
- 52. Soto-Perez-de-Celis E. Social media, ageism, and older adults during the COVID-19 pandemic. EClinicalMedicine 2020;29-30:100634.
- 53. Garcia M, Homan P, García C, et al. The Color of COVID-19: Structural Racism and the Disproportionate Impact of the Pandemic on Older Black and Latinx Adults. Journals Gerontol Ser B 2020;76(3):e75–80.
- Sáenz R, Garcia MA. The disproportionate impact of covid-19 on older latino mortality: the rapidly diminishing latino paradox. J Gerontol B Psychol Sci Soc Sci 2021;76(3):e81–7.

- 55. Ma K, Bacong A, Kwon S, et al. The Impact of Structural Inequities on Older Asian Americans During COVID-19. Front Public Health 2021;9.
- 56. Stopaapihate.org. 2022 [online] Available at: https://stopaapihate.org/wpcontent/uploads/2022/03/22-SAH-NationalReport-3.1.22-v9.pdf. Accessed March 19, 2022.
- 57. Npr.org. More Than 9,000 Anti-Asian Incidents Have Been Reported Since The Pandemic Began. 2022. Available at: https://www.npr.org/2021/08/12/ 1027236499/anti-asian-hate-crimes-assaults-pandemic-incidents-aapi. Accessed March 18, 2022.
- 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.