

Research Article

Older individuals and preventative behavioural interventions for COVID-19: a scoping review and perspective on wellbeing

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Background

In response to the COVID-19 pandemic, nations around the world introduced a range of behavioural interventions and restrictions in order to manage the spread of the virus. These included social distancing, lockdowns, and use of personal protective equipment, amongst others. The aim of the present paper is to examine some of the effects of these interventions on the psychological wellbeing and mental health of older adults, especially those with hearing loss.

Methods

The present review focused on published peer reviewed studies focusing on older adults. Search engines included Google Scholar, SpringerLink Journals, ProQuest Central, and PubMed employing different combinations of search terms such as “COVID-19”, “older adults”, and “isolation”.

Results

Older adults were at risk of experiencing increased anxiety and depression and poorer wellbeing during lockdowns across nations, with those self-reporting loneliness reporting more severe symptomatology. Reductions in wellbeing were observed both amongst community-dwelling older adults and those living in residential care facilities. Use of personal protective equipment, especially masks, and social distancing requirements impacted communication amongst older adults with hearing loss, with this subgroup reporting increased depression, anxiety, and stress, with symptoms increasing with the severity of the hearing loss.

Conclusions

While technology can help to mitigate the impacts of lockdowns and restrictions, limited access to devices and a range of challenges in upskilling older adults has impacted the utility of these technologies for promoting wellbeing. Education and training in the use of technologies and digital devices for both older adults and families might assist in promoting wellbeing, with increased accessibility needed in aged care facilities to further support the wellbeing of residents.

At the time of writing, the death toll due to COVID-19 stands at >6.94 million¹ with the risk of death increasing with older age. According to the Centers for Disease Control in early 2023, the rate ratio was 25 for 50-64 years old and 360 for 85 years of age and older as compared to those aged 18-29 years old.² The COVID-19 pandemic exposed a lack of infection control among older adults. In Australia, 75.4% of COVID-19-related deaths were in aged care facilities.³ Strong behavioural (non-pharmaceutical) interventions were employed in many countries to reduce the impact of COVID-19 including to protect the residents of aged care facilities. These interventions clearly worked such as

for lockdown.⁴ However, any negative effects of these interventions need to be considered and mitigated.

BEHAVIOURAL INTERVENTIONS FOR COVID-19

Behavioural interventions to try and reduce the impact of the pandemic included self-isolation, social distancing, school closure, a ban on public events, lockdowns, and the use of personal protective equipment (PPE) including masks.^{5,6} A limited assessment of the impact of these interventions across 11 European countries suggests that they worked to reduce the reproduction number (R_t), thus saving lives and sparing many from the psychological impacts as-

sociated with losing a loved one, be they old or young.⁵ In Spain, for example, lockdowns helped contain COVID-19, thus saving lives, reducing morbidity, and reducing the pressure on the health care system including intensive care units.⁷ Lockdowns also potentially saved lives through other means, for example, reductions in trauma-related hospital admissions were reported, indicating a reduction in motor vehicle accidents.⁸

The present review paper examines some of the effects of behavioural interventions related to the COVID-19 pandemic with a focus on wellbeing and mental health related interventions among older adults, especially those with hearing loss.

METHODS

ELIGIBILITY CRITERIA

Eligible studies reported on mental health outcomes (e.g., psychological distress, depression, anxiety and/or loneliness) and/or hearing loss for older adults (>60) living in the community or aged care settings. Studies reporting on outcomes in relation to any specific behavioural intervention for COVID-19 (social distancing, mask wearing, lockdowns/stay at home orders), or on strategies to mitigate such mental health outcomes for older adults were included. Studies reporting on the general older adult population as well as those with a specific focus on hearing loss (either self-reported or objectively assessed) were eligible. Studies that were written in English and published in peer reviewed journals of any study design, reviews, and perspectives were also eligible. The review did not have any time restrictions.

SEARCH STRATEGY

Search engines were searched from inception via Springer-Link Journals, PubMed, and ProQuest Central. Search string included key terms such as “COVID-19”, “pandemic”, “older adults”, “elderly”, “ageing”, “wellbeing”, “mental health”, “psychological distress”, “isolation”, and “loneliness”.

DATA EXTRACTION

Data were extracted using a standard template, which included year of publication, country of participants, sample size, sample characteristics (such as community-dwelling, aged care), study design, behavioural intervention(s) considered, mental health outcomes, and mitigation strategies.

DATA SYNTHESIS

Given the lack of homogeneity in COVID-19 regulations, data were narratively synthesised by results pertaining to intervention and subpopulations (e.g., living in aged care, older adults with hearing loss).

RESULTS

In total, 29 studies were included ([Table 1](#)). Studies were predominantly conducted in the US (n=8), Canada (n=3),

France (n=3), and Italy (n=3), with studies also conducted across Japan, Australia, Hong Kong, China, Philippines, UK and Taiwan. Participants (pooled N=32,423) were mostly community-dwelling, with four studies reporting on older adults living in residential care facilities. A variety of behavioural interventions were considered, most commonly lockdowns (n=15), social distancing (n=8), use of PPE (n=6), and restricted visitation (n=4).

WHAT ARE THE EFFECTS OF BEHAVIOURAL INTERVENTIONS?

WHAT ARE THE IMPACTS OF ISOLATION AND LOCKDOWNS ON OLDER ADULTS?

The review highlights that behavioural interventions do not come without their challenges. In retirement homes in France, residents with Alzheimer’s disease were reported by caregivers as displaying large increases in depression and anxiety rates due to COVID-19.⁹ However, findings on individuals’ mental health are mixed with one German study reporting little effect of COVID-19 on depression, anxiety, and loneliness.¹⁰ These authors suggested that high levels of resilience due to increased life experience may have acted as a protective factor for older individuals. Relatedly, some results have indicated that the mental health of younger adults was worse than that of older adults during the height of the pandemic.¹¹ While there have been some variations in study findings of the impacts of COVID-19 for mental health more broadly, commonly, studies suggest that older age was associated with poorer wellbeing during lockdowns.¹² A recent systematic review reported that COVID-19 had deleteriously affected the mental wellbeing of older adults aged 60 years and older, with depression and anxiety reported in response to lockdowns across Asia, Europe, and North America.¹³ [Table 2](#) summarises the key effects of different behavioural interventions on older individuals.

Increased depression and anxiety were likely due to the increased loneliness experienced during lockdowns.¹⁴ For example, over half of community dwelling adults in the US reported worsened loneliness, and those with high loneliness scores were significantly more likely to experience symptoms of depression (62% vs. 9%; $p<.001$) and anxiety [57% vs. 9%; $p<.001$; 15]. It has further been argued that the social isolation resulting from lockdowns would increase suicide rates,²⁴ although this remains to be examined, with the longer-term impacts still unclear. In addition to social isolation, fears of dying due to reduced medical access during lockdowns has also been shown to have been associated with distress and anticipatory grief amongst octogenarians.¹⁶

WHAT ARE THE IMPACTS OF SOCIAL DISTANCING AND USE OF PPE?

PPE, especially masks, can impact communication for those with hearing loss (HL).⁶ Masks hide visual cues and facial expressions, prevent lip reading,¹⁹ muffle sounds,¹⁸ attenuate higher frequencies, and reduce the decibels of

Table 1. Characteristics and Summary of Included Studies

Study	Country	Study design	N	Sample	Behavioural intervention(s)	Mental Health Outcomes; sensory impairment	Mitigation Strategies	Main Results
Best et al. (2020)	USA	Longitudinal	8,628	Older and younger adults 18–101 (M=49.2 years, SD=16.4)	Lockdowns	Depression (PHQ-4), self-reported depression or anxiety diagnosis	-	Younger adults reported higher levels of distress than older adults
Buenaventura et al. (2020)	Philippines	Perspective/Opinion	-	-	-	-	Increased mental health care access	Challenges to meet health care needs are amplified in developing nations, leading to less access to mental health care, increased care may improve older adults' mental health
Banskota et al. (2020)	USA	Review	-	Older adults in residential care facilities	Lockdowns, visiting restrictions	-	Smartphone apps	Apps can provide ways to allow families to stay connected
Chu et al. (2020)	Canada	Intervention	NR	Older adults in long-term care facilities	Visiting restrictions	Social isolation	Teleconferencing	Teleconferencing may improve wellbeing and reduce loneliness
Cosh et al. (2019)	France	Review	-	Older adults with HL	-	-	-	Older adults with HL have higher risk of depression
Eghtesadi (2020)	Canada	Perspective/Opinion	-	Older adults in residential care facilities	Lockdowns, visiting restrictions	-	Access to technology	Access to technology is limited, increasing access may promote wellbeing
El Haj et al. (2020)	France	Pseudo-longitudinal	58	Aged care residents with Alzheimer's Disease (M=71.8 years, SD=5.5)	Social distancing	Anxiety and depression symptoms (HADS)	-	Higher scores on depression and anxiety during the pandemic compared with previously
Frenkel-Yosef et al. (2020)	Israel	Cross-sectional	295	Older adults >60 (M=75.73 years)	Lockdowns	Loneliness (UCLA Loneliness Scale -3) Psychological distress (4-items)	-	Loneliness increased with age, and was associated with greater distress Few face-to-face interactions was associated with greater loneliness
Gaeta (2020)	USA	Cross-sectional	150	Community-dwelling older adults	PPE – masks	Self-reported hearing status	-	Masks muffle sounds and limit lip reading

Study	Country	Study design	N	Sample	Behavioural intervention(s)	Mental Health Outcomes; sensory impairment	Mitigation Strategies	Main Results
Goulabchand et al. (2020)	France	Observational	NR	Hospital patients	Social distancing, Visiting restrictions	Grief, coping	Digital tablets	Use of tablets helps families to cope
Gupta & Dhamija (2020)	India	Perspective/ Opinion	-	-	Lockdowns	Isolation	Technology access	Access to technology remains limited, increased access may reduce isolation
Hwang et al. (2020)	Taiwan, Canada, Australia, Japan	Perspective/ Opinion	-	-	Lockdowns	-	Technology to enhance social interactions	Increased use of technology will support mental health through reduced isolation
Ishikawa (2020)	USA	Qualitative	NR	Older adults	Lockdowns, social distancing	Loneliness, anticipatory grief	-	Older adults' mental health has been impacted by the pandemic, and experience loneliness and anticipatory grief
Kotwal et al. (2021)	USA	Prospective	151	Community-dwelling older adults (M=75.3 years, SD=10.1)	Lockdowns	Loneliness (2-items, UCLA loneliness scale), Anxiety (GAD2), depression (PHQ2)	-	Increased depression and loneliness during pandemic
Kuwahara et al. (2020)	Japan	Perspective/ Opinion	-	Community dwelling older adults	Lockdowns	Social isolation	Smartphones	Older adults have limited access to smartphones and technology needed to reduce isolation
Naylor et al. (2020)	Scotland	Cross-sectional	129	Adults with hearing loss - 27 to 76 years (M=64.4 years)	Lockdowns, PPE - face masks, social distancing, video conferencing	Diagnosed HL	Subtitles for teleconferences	Desire for transparent mask use, greater difficulty understanding teleconference than face-to-face interactions, subtitling was beneficial
Röhr et al. (2020)	Germany	Cross-sectional	1,005	Representative sample >65 (M=75.5 years, SD=7.1)	Lockdowns	Psychological distress (BSI-18), loneliness (UCLA loneliness scale -3), resilience (BRS)	-	67.5% reported moderate resilience, 18.6% had high resilience, prevalence of loneliness was 13.1%
Rolandi et al.	Italy	Intervention	130	Older adults	Lockdowns	Loneliness	Training in use of	Those who received training had higher

Study	Country	Study design	N	Sample	Behavioural intervention(s)	Mental Health Outcomes; sensory impairment	Mitigation Strategies	Main Results
(2020)				81-85 years (M=81.8 years, SD=1.4)		(UCLA loneliness scale)	social networking sites	use of social networking sites and less loneliness
Saunders et al. (2021)	UK	Cross-sectional	460	General population with and without hearing loss	PPE – masks,	Self-reported HL	-	Masks negatively impacted hearing and interacting
Sepúlveda-Loyola et al. (2020)	Asia, Europe and America	Narrative review	20,069	Community dwelling adults >60 years	Lockdowns, social distancing	Anxiety, depression, sleep quality	-	Prevalence of anxiety and depression on older adults were high during lockdowns
Tagupa (2020)	USA	Perspective/Opinion	-	-	PPE – masks, social distancing	Loneliness, isolation, hearing loss	-	Older adults with hearing loss report reduced interpersonal connectedness and increased isolation
Ten Hulzen & Fabry (2020)	USA	Perspective/Opinion	-	-	PPE – masks, social distancing	Hearing Loss	-	Masks limit communication for people with HL, social distancing reduces ability to hear speech and interact with others
Trecca et al. (2020)	Italy	Cross-sectional	59	Consecutive hospital referrals, older adults with HL, (M=60 years)	PPE – masks	Diagnosed Hearing Impairment, self-reported difficulties communicating	-	Masks hide visual cues and facial expressions, and prevent lip reading
Wand et al. (2020)	China, Hong Kong, Italy, and Australia	Perspective/Opinion	-	Older adults	Lockdowns, quarantine, social distancing	Suicide	-	Suicide may increase due to loneliness, lack of access to services and social support, economic factors
Wong et al. (2020)	Hong Kong	Prospective Cohort	583	Adults >60	Lockdowns	Depression (PHQ-9), Anxiety (GAD7), loneliness (De Jong Gierveld Loneliness Scale)	-	Increased loneliness, depression and anxiety were observed compared with pre-pandemic
Yang et al. (2021)	China	Cross-sectional	706	Adults with and without	-	Depression, anxiety and	-	Those with hearing loss had higher rates of severe psychological distress

Study	Country	Study design	N	Sample	Behavioural intervention(s)	Mental Health Outcomes; sensory impairment	Mitigation Strategies	Main Results
				HL		stress (DASS-21, impact of events (IES))		
Zubatsky et al. (2020)	USA	Intervention	NR	Community dwelling older adults	Lockdowns	-	Telehealth social group	Telehealth can connect isolated and lonely older adults

Note. PHQ=Patient Health Questionnaire; HL=hearing loss; HADS=Hospital Depression and Anxiety Scale; PPE=Personal Protective Equipment; NR=not reported; GAD=Generalised Anxiety Disorder measure; BSI-18=Brief Symptom Inventory – 18; BRS=Brief Resilience Scale; DASS-21=Depression, Anxiety and Stress Scale; and IES=Impact of Events Scale.

Table 2. Summary of Effects of Behavioural Interventions on Older Adults

Factors	Effects on older individuals
Lockdown	Increased loneliness and distress ^{13,14} affecting: - Females living alone - People with low activity levels - People with negative views of ageing
Isolation and lockdown	- Mixed effects on anxiety and depression, limited effects in Germany¹⁰ but high negative effects in France among residents with Alzheimer's disease⁹ - Worse wellbeing¹² - Worse wellbeing among those in Asia, Europe, and North America who were suffering anxiety and depression¹³ - Increased loneliness (USA)¹⁵ - Fear of dying due to less medical care access¹⁶
Social distancing	Distancing affects those with hearing loss¹⁷
Masks	- Masks affects those with hearing loss^{6,17-19} - Reduce feelings of interpersonal connectedness²⁰ - Increase feelings of isolation²⁰
Where you live	- Living in non-profit care homes was a protective factor²¹ - Living in a for profit care home was a risk factor²¹
Technology	- Allowed people to say goodbye to dying loved ones²² - Enabled social support²³

Note. Behavioural interventions (e.g., self-isolation, social distancing, school closure, a ban on public events, lockdowns, and the use of PPE including masks); PPE = personal protective equipment.

speech,¹⁷ all of which impinge upon the ability of those with HL to communicate. For example, over 85% of older adults with HL reported difficulties in communication as a result of masks in a health care setting in Italy.¹⁹ Similarly, over one half of community dwelling older adults in the US reported difficulties communicating with people wearing masks.¹⁸ Further, sounds quickly decrease in volume as they move further away from the speaker, thus social distancing can also exacerbate communication challenges for those with HL.¹⁷ While telehealth and video conferencing were often used as alternatives during COVID-19 restrictions, these can also become challenging for those with HL due to lags and poor image quality,⁶ resulting in the ability to communicate during video calls being inferior to face-to-face interactions.²⁵

The challenges for communication due to social distancing and masks leave older adults with HL reporting reduced feelings of interpersonal connectedness and increased feelings of isolation.²⁰ Consequently, older adults with HL report increased depression, anxiety, and stress,^{26,27} and such symptoms increase with severity of the HL.²⁵

DOES WHERE YOU LIVE AFFECT YOUR OUTCOME?

Residents in long-term care homes had limited access to social interactions with restrictions imposed on visitation^{28,29} and longer periods spent alone in their rooms.³⁰ Therefore, lockdown restrictions might especially have impacted aged care residents. However, community dwelling adults are likely to have also been impacted by reductions in community supports and home care services during lockdowns.²⁸ Direct comparison of mental health outcomes be-

tween community dwelling older adults and aged care residents remains minimal.

Although COVID-19 restrictions were observed globally, it has been argued that the impacts of these restrictions may have been more pronounced in developing nations where technology access for digital communications is limited.³¹ Furthermore, the challenge of meeting basic health care needs in developing countries during the pandemic may have resulted in reduced mental health care, especially for older adults who already experience limitations to health care access.³²

WHAT CAN BE DONE TO HELP REDUCE THE EFFECTS OF BEHAVIOURAL INTERVENTIONS?

Technology was widely employed to help mitigate the effects of lockdowns, enabling family and friends to communicate such as through video chat software on tablets or smartphones, while minimizing the risk of spreading infection.^{22,33} Such technology was also employed in end of life interactions to enable patients to say goodbye to friends and relatives²² Social support groups for older adults have also successfully adapted to a telehealth delivery, enabling older adults to remain engaged in social interaction during lockdowns.²³

Despite the potential benefit of online technologies to reduce loneliness for older adults, a range of challenges to using online and digital communications with older adults have been noted and include lower rates of smartphone use and internet connectivity, a lack of competence with technology, and negative attitudes towards technology.^{28,34} Upskilling older adults in the use of digital technologies and strategies to increase access are needed to support older

adults to remain socially engaged. Notably, in one study, octogenarians who had received training in the use of social networking sites reported significantly higher usage of social networking and reduced feelings of isolation and social exclusion during lockdowns in Italy.³⁵ This suggests that dedicated training may assist in reducing barriers in the use of digital technologies amongst older adults.

DISCUSSION

RECOMMENDATIONS

Policy makers and researchers need to take the lessons from this pandemic and implement changes and then examine the effects of such changes. Thus, this pandemic may lead to long-term improvements in aged care.

For those with HL, the use of clear surgical masks would have facilitated lip and facial cue reading, which may have reduced the barriers associated with PPE for those with HL.⁶ Incorporating sign language into the care of those with HL would be a low cost method that would be non-technology dependent. Speech-to-text applications including use of subtitles on video calls could assist those with HL to communicate.²⁵ While speech-to-text smartphone applications and subtitling technology is available, these technologies are not currently widely utilized¹⁸ and ownership of digital devices is commonly lower amongst those with sensory losses than the general population.³⁶ Increasing availability and access would potentially benefit many older adults with HL. Increasing education for family members in the availability and use of these technologies may also help relatives to continue contact and thus promote wellbeing in older adults with sensory loss.³⁷

There is a need to increase the use of digital technologies in order to help connect families and provide social support.²⁹ Ensuring access to devices with captioning and speech-to-text applications will better enable residents with HL to interact socially in aged care settings.³⁸ Currently, while video calls can reduce feelings of loneliness amongst residents of aged care facilities,³⁹ up to three-quarters of aged care residents report no or minimal video or internet-based interactions with relatives and friends.¹⁵ The barriers have been reported as including a lack of access to digital devices³⁰ and an inability to confidently use these technologies.²⁸ In the future of aged care, these barriers will need to be overcome through ensuring resident access to devices, as well as by providing training in technologies, devices, and applications for staff, residents, and relatives.

Alternatively, an increased use of telephone support may be employed as a means to promote social connection and wellbeing in aged care. In one study, residents of long-term aged care facilities reported a slight preference for telephone calls over video calls (55.3% vs. 44.7%), with telephone calls more easily completed independently than video calls.⁴⁰ A recent program which paired medical students with an aged care resident for regular social telephone calls was shown to be viable for promoting the psychosocial wellbeing of residents.⁴¹ In a similar program, telephone calls were reported as beneficial for both the

health care professional student volunteers and the aged care residents.⁴²

Telehealth is clearly here to stay and the increase in its use during the pandemic may lead to increased access post-pandemic in relation to physical and mental health services.^{43,44} Telehealth will be especially beneficial for overcoming other barriers to service access, such as frailty and mobility limitations, which are common amongst aged care residents.

LIMITATIONS AND FUTURE STUDIES

Different countries and different government areas within countries implemented a multitude of COVID-19-related guidelines and laws thus making systematic comparisons difficult if not impossible across countries. Therefore, the present review focuses on key outcomes for older adults without trying to draw any strong generalizable outcomes.

Future studies need to examine the long-term effects of changes in policy related to aged care due to the pandemic. These studies also need to examine how technology is being adapted to the post-pandemic environment such as in relation to improving interpersonal relationships such as through family social support via video communication, families playing virtual games together, and watching videos together while chatting. Different approaches improving interactions for those with HL need to be examined and how they deal with speech difficulties often associated with HL.

CONCLUSIONS

Behavioural interventions such as social distancing, PPE, and lockdowns clearly work to reduce infection and death rates among older adults. However, such interventions come with potential side effects for this population such as through potential increases in depression, anxiety, and loneliness which need to be mitigated. Another side effect of these interventions is the reduced ability to communicate, especially for individuals with HL. The key to reducing the negative effects of these interventions has been the employment of technology such as access and education related to telehealth, and internet enabled communication such as video and chat. Thus, if we learn the right lessons from this pandemic we may contribute to long-term improvements in aged care long after the pandemic has passed.

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AUTHORSHIP CONTRIBUTIONS

EBT and SC conceived of the study. SC and EBT gathered data. SC and EBT created tables. EBT and SC wrote the initial draft. EBT, SC, and NL edited the draft and approved its final version.

DISCLOSURE OF INTEREST

The authors completed the ICMJE Disclosure of Interest Form (available upon request from the corresponding author) and disclose no relevant interests.

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