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Exploring the Access and Use of Social Technologies by Older Adults in Support of Their Mental Health During the COVID-19 Pandemic: A Rapid Review

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Article

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Résumé

Les confinements liés à la COVID-19 affectent les personnes âgées de façon disproportionnée. La plupart des personnes âgées souffrant d'isolement social et de solitude, ces confinements entraînent des taux plus élevés de dépression et d'anxiété chez les personnes âgées. Cette étude explore l'accessibilité, les effets et les défis liés à l'utilisation des technologies sociales par les personnes âgées qui vivent dans la communauté ou dans des établissements de soins de longue durée, qui sont atteintes de troubles neurocognitifs ou qui sont en situation de pré-fragilité ou de fragilité, afin d'éclairer la recherche future dans ce domaine. Nous avons récupéré des articles de quatre bases de données en ligne, notamment Medline, AgeLine, EconLit et CINAHL, et de la littérature grise de Google Scholar. Sur les 131 articles consultés, 24 ont été inclus dans cette revue. Les *résultats positifs* comprennent une amélioration de la santé mentale et physique, une réduction des disparités en matière de santé et une autonomie accrue. Les *résultats négatifs* incluent l'amplification du fossé numérique. Des recherches supplémentaires sur les impacts économiques des technologies sociales sont nécessaires.

Abstract

Coronavirus disease (COVID-19) lockdowns disproportionately affect older people where most suffer from social isolation and loneliness, which translate into higher rates of depression and anxiety. This study aimed to explore the accessibility, outcomes, and challenges of social technology use among community-dwelling older adults, older adults in long-term care, older adults with neurocognitive disorder, and older adults with pre-frailty and frailty, to help guide future research in this area. A rapid review was conducted, and articles were retrieved from four online databases, including Medline, AgeLine, EconLit and CINAHL, and grey literature from Google Scholar. Of the 131 articles retrieved, 24 were included in this review. The *positive outcomes* of social technology use include improved mental and physical health, reduced health disparities, and increased autonomy. *Adverse outcomes* include furthering the digital divide. More research surrounding the economic impacts of social technologies is warranted.

Introduction

At the end of 2019, the first cases of coronavirus disease (COVID-19) appeared in Wuhan, China, and have since spread worldwide (Mueller, McNamara, & Sinclair, 2020). A previously conducted review reported that COVID-19 disproportionately affects older people, indicating approximately 80 per cent of hospitalizations in adults over 65 (Mueller et al., 2020). The same study also highlighted that this age group has a risk of death 23 times greater than that under 65. Stemming from these review findings, the public health measure of social distancing was put in place to minimize in-person contact to limit the spread of disease (Chen et al., 2021). This approach was instrumental in ensuring the population's safety and reducing the COVID-19 pandemic's overall impact on health; however, it also produced unintended consequences, especially for older adults (Kotwal et al., 2020). Unfortunately, increased social isolation resulting from social distancing is associated with increased depression and suicidality, which is linked to pro-inflammatory and reduced anti-viral immune responses (Jawaid, 2020). These unintended consequences increase susceptibility to COVID-19 in older adults. Social isolation is also associated with increased health care costs and medical risks, as well as limiting access to caregivers and impacting financial and emotional support (Kotwal et al., 2020). While some

older adults may struggle to adapt to the lifestyle changes brought by the new social distancing measures put in place, community and family support have been a key factor in helping them successfully adapt to these new changes.

To avoid adverse mental health effects for older adults during the pandemic, there is an immediate need to foster social connections for older adults through social technologies, including smartphones, robots, and tablets enabling communication (Eghtesadi, 2020). Considering these recent technologies and their implication for the mental well-being of older adults, it is crucial to determine the outcomes and challenges associated with using social technologies for older adults. Previous studies report short-term benefits of social technology use among older adults, such as developing a positive attitude toward the usability and usefulness of technology; improved well-being; feeling of connectedness and long-term benefits, such as improving self-esteem to help against cognitive decline; improved physical health; and better management of chronic diseases (Canadian Coalition for Seniors' Mental Health, 2021; Chopik, 2016; Eghtesadi, 2020).

Many leaders and decision makers, particularly in the context of aging care, were faced with a policy question concerning the feasibility and fiscal implications of investing in social technologies for older adults and long-term care (LTC) residents during the COVID-19 pandemic. Considering the timing and urgency of the policy question, more evidence surrounding the outcomes and challenges of social technologies and their impact on mental health is warranted. The primary research question that guided this study was: What are the outcomes and challenges of social technology use by older adults in support of their mental health during the COVID-19 pandemic? Stemming from this research question, the primary objective of this study was to explore the accessibility, outcomes, and challenges of social technology use among older adults during the COVID-19 pandemic to help guide future research in this area.

Methods

This study utilized a rapid review design guided by the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) 2020 expanded checklist (Page et al., 2021). According to the Canadian Agency for Drugs and Technology (CADTH), rapid reviews are performed to synthesize literature on technology use in health care in a timely manner (Canadian Agency for Drugs and Technology, 2022). Therefore, this type of study design was utilized as health system planners in LTC needed timely evidence to inform resource allocation decisions for technology uptake during the COVID-19 pandemic. A PRISMA flow diagram was used to depict the stages involved in the selection process (Figure 1).

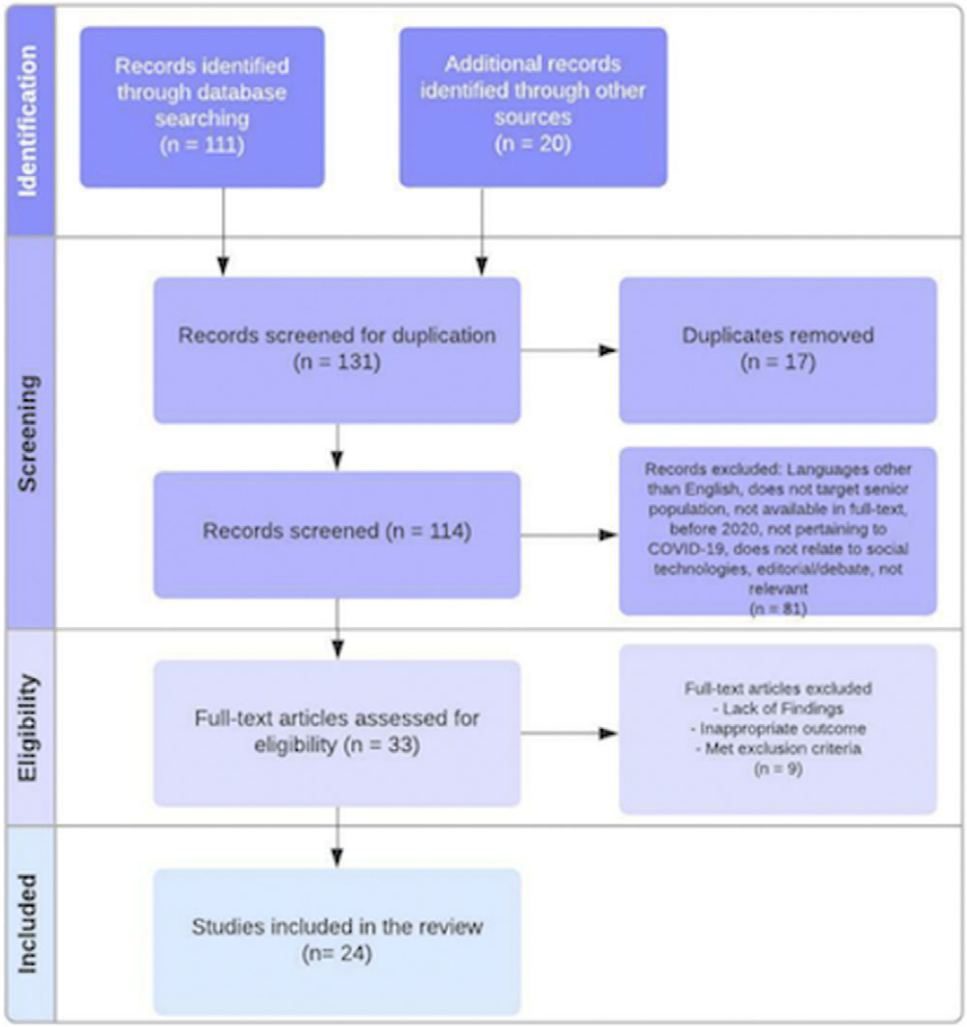

Figure 1. PRISMA flow diagram. PRISMA indicates Preferred Reporting Items for Systematic Reviews and Meta-Analysis (Page et al., 2021).

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Data Sources and Search Strategy

This rapid review was conducted from May to June 2021. Articles were retrieved from four databases: MedLine via OVID (May 14, 2021); AgeLine via EBSCOhost (May 13, 2021); EconLit via EBSCOhost (May 13, 2021); and CINAHL via EBSCOhost (May 14, 2021), along with grey literature searches in Google Scholar (June 20, 2021). The database searches were conducted within two consecutive days to ensure consistency and minimize bias across the findings among the different databases, as the COVID-19 pandemic was still unfolding. The Google Scholar search was conducted in June 2021 to supplement the peer-review search and to include grey literature. Selected medical subject heading (MeSH) terms were used for database searches and were combined with free text terms related to the cost, social technology, older adults, mental health, and COVID-19. The database search terms are listed in Table 1.

When searching in the MedLine database, search term combinations of five, four, and three concepts were computed (see Table 1). This initial search resulted in a total of 44 results. In AgeLine, EconLit, and CINAHL databases, search term combinations of five and four were computed, which resulted in a total of 39, 15, and 13 search results, respectively (n = 111; see Figure 1). Additionally, there were 850 total results using the search terms for Google Scholar. After adding the parameter "Since 2020," there were 727 results. Only the first two pages (first 20 results) that appeared after adding the parameter "Sort by relevance" were included in the study (n = 20; see Figure 1).

Eligibility Criteria

Studies were considered eligible if they (a) were either peer-reviewed or non-peer-reviewed articles, comparative and non-comparative literature and best practice guidelines; (b) targeted older adults; (c) related to social technologies; (d) pertained to COVID-19 (i.e., published from December 2019 to May 13, 2021 (AgeLine via EBSCOhost & EconLit via EBSCOhost), May 14, 2021 (MedLine via OVID & CINAHL via EBSCOhost), and June 20, 2021 (Google Scholar); and (e) included an economic analysis. Studies were excluded if they were (a) not available in full-text articles; (b) not written in English; (c) not targeted to older adults; (d) not related to social technologies; (e) not pertaining to COVID-19; and (f) editorials or debates. Study populations targeting older adults found in points for (a) eligibility and (b) exclusion can be defined as "older adults," "older people," "elderly/elders," or "long-term care residents."

Study selection procedure and data extraction

Two researchers (JD and AK) independently reviewed the titles/abstracts of 131 articles and applied the eligibility criteria to screen the articles. The remaining 33 articles underwent full-text review, ultimately resulting in a total of 24 articles. The screening was done manually, without the use of an externally derived machine-learning classifier. Articles were only included during the title and abstract screening if the eligibility criteria listed above were fulfilled. Disagreements were resolved through consensus. Zotero reference management software was used to manage bibliographic data, and all duplicate articles were removed.

For data extraction, a population, intervention, comparator, outcome, and study (PICOS) design table was used by both reviewers (Methley, Campbell, Chew-Graham, McNally, & Cheraghi-Sohi, 2014). The population of the study mainly focused on community-dwelling older adults, older adults in LTC homes, older adults with neurocognitive disorder (NCD) and their caregivers, and older adults with pre-frailty and frailty. The interventions combined devices used for social networking and devices used for eHealth purposes, as they are not mutually exclusive groups and may be used for both purposes. The targeted interventions were information and communication technologies (ICTs), hybrid solutions including digital infrastructure and community support systems, telephone services, video communication, educating older adults on how to use ICTs/digital technologies, video telehealth, smartphone apps, and social media. In the comparator, we looked for usual care (status quo) or no comparator. The primary outcomes of this study focused on mental health, including social isolation and other physical and social outcomes (Table 2).

Synthesis

Data were extracted and tabulated in the PICOS format. The synthesis was informed by the data in the results section. Due to the heterogeneity in the study design, methods, and setting of all the articles included in the rapid review, a meta-analysis was not conducted. The data extracted from the selected studies were summarized into themes and emerging themes.

Results

Study Characteristics

Country and journal information was collected from the selected studies (Table 3). From the 24 studies included were 2 studies from each of the following journals: *Journal of Aging & Social Policy*; *Journal of Applied Gerontology*; *Journal of Post-Acute and Long-Term Care Medicine*; and *Geriatrics.* Also included was one study from each of the remaining journals. The distribution of publications by country was as follows: U.S. (10), Canada (4), England (3), Hong Kong (2), China (2), Portugal (1), Germany (1), India (1), New Zealand (1), and Austria (1) (see Table 3).

The studies included in this rapid review can be categorized into four separate cohorts, namely (a) community-dwelling older adults, (b) older adults in LTC, (c) older adults with neurocognitive disorder, and (d) older adults with pre-frailty and frailty. Seventeen studies were included in the "community-dwelling older adults" cohort (Ammar et al., 2020; Amundsen, 2021; Banskota et al., 2020; Conroy et al., 2020; Day et al., 2020; Garcia et al., 2021; Gorenko et al., 2021; Hoffman et al., 2020; Juvonen et al., 2021; Kotwal et al., 2020; MacLeod et al., 2021; Rolland, 2020; Sixsmith, 2020; Wallinheimo & Evans, 2021; Whitehead & Torossian, 2021; Xie et al., 2020; Zamir et al., 2020). If the study declared their study population as "older adults," "elders," "older people," "elderly," "older adults over the age of 55," or "community-dwelling older adults age 60 and older," they were included in the category of "Community-dwelling Older Adults." Four studies were included in the "Older Adults in LTC" cohort (Bethell et al., 2021; Gallistl et al., 2021; McArthur et al., 2021; Seifert et al., 2021). If the study declared their study population as "older adults in LTC facilities," "LTC residents," "residents of LTC homes, care homes, and nursing homes," or "older adults in LTC homes," they were included in the "Older Adults in LTC" cohort. The only study included in the "Older Adults with Neurocognitive Disorder" cohort is the study by Lai et al. (2020). Finally, the only study included in the "Older Adults with Pre-frailty and Frailty" cohort is the study by Chen et al. (2021).

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Table 1. Database search terms

	MEDLINE (OVID)	AgeLine	EconLit	CINAHL	Google Scholar
Concept 1:	**Keywords and phrases:**	**Keywords and phrases:**	**Keywords and phrases:**	**Keywords and phrases:**	**Keywords and phrases:**
Economic Evaluation (Cost)	"health care economics and organizations"/ or economics/ or "costs and cost analysis"/ or cost-benefit analysis/	Cost* OR budget* OR "cost benefit" OR "cost effective*" **Search Options:** **Expanders –** Apply equivalent subjects **Search modes –** Find all my search terms	Cost* OR budget* OR "cost benefit" OR "cost effective*"	(MH "Cost Benefit Analysis") OR (MH "Costs and Cost Analysis")	(cost OR economic)
Concept 2:	**Keywords and phrases:**	**Keywords and phrases:**	**Keywords and phrases:**	**Keywords and phrases:**	**Keywords and phrases:**
Social technology (Tech)	Electronics/ or digital technology/	"social technology" OR (digital technology or digital technologies) OR (ipad or tablet) OR video call OR (technology and society) **Search Options:** **Expanders –** Apply equivalent subjects **Search modes –** Find all my search terms	"social technology" OR (digital technology or digital technologies) OR (ipad or tablet) OR video call OR (technology and society)	MH ("Technology+/EC") OR social technology	("Social technolog*" OR "video calls" OR skype OR "video chat" or facetime)
Concept 3:	**Keywords and phrases:**	**Keywords and phrases:**	**Keywords and phrases:**	**Keywords and phrases:**	**Keywords and phrases:**
Long-term care resident (LTC)	Exp Long-Term Care/	"long term care" OR (long-term care or nursing home or residential care or assisted living) OR (seniors or elderly) OR (seniors or older adults or elderly or geriatric or aged) OR retirement home **Search Options:** **Expanders –** Apply equivalent subjects **Search modes –** Find all my search terms	"long term care" OR (long-term care or nursing home or residential care or assisted living) OR (seniors or elderly) OR (seniors or older adults or elderly or geriatric or aged) OR retirement home	MH "Long Term Care" OR MH "Nursing Home Patients" OR (seniors or elderly)	(elder* OR senior)
Concept 4:	**Keywords and phrases:**	**Keywords and phrases:**	**Keywords and phrases:**	**Keywords and phrases:**	**Keywords and phrases:**
Mental Health (MH)	Depression/ or stress, psychological/ or social isolation/ or anxiety/ or psychological distress/ or loneliness/ or mental health/	mental health OR (anxiety and depression) OR (wellbeing or well-being or well being) OR (social isolation or loneliness or social exclusion) **Search Options:** **Expanders –** Apply equivalent subjects **Search modes –** Find all my search terms	mental health OR (anxiety and depression) OR (wellbeing or well-being or well being) OR (social isolation or loneliness or social exclusion)	MH "Mental Health" OR (wellbeing or well-being or well being) OR (social exclusion or socially excluded or social isolation)	("Mental health" OR isolation OR loneliness)
Concept 5:	**Headings:**	**Keywords and phrases:**	**Keywords and phrases:**	**Keywords and phrases:**	**Keywords and phrases:**
COVID-19 (COVID)	COVID-19 **Keywords and phrases:** coronavirus/ or covid-19/	covid-19 OR (covid-19 or coronavirus or 2019-ncov or sars-cov-2 or cov-19) OR social distancing covid 19 **Search Options:** **Expanders –** Apply equivalent subjects **Search modes –** Find all my search terms	covid-19 OR (covid-19 or coronavirus or 2019-ncov or sars-cov-2 or cov-19) OR social distancing covid 19	MH "COVID-19" OR (coronavirus or covid-19 or 2019-ncov)	(COVID-19 OR coronavirus)

Table 2. Population, intervention, comparator, outcome, and study (PICOS) design

Author, Publication Year	Population (P)	Intervention (I)	Comparator (C)	Outcome (O)	Study Design (S)
(Xie et al., 2020)	Older adults	Hybrid solution using a digital infrastructure and community support systems	N/A	Improved eHealth literacy, reduced health disparities, increased accessibility to electronic medical records on an online platform, increased autonomy, improved access to health care, food, and other services, and increased social interaction.	Commentary
(Seifert, Cotten, & Xie, 2021)	Older adults in long-term care facilities	Information and Communication Technologies (ICTs)	N/A	Social participation, digital inclusion, and higher autonomy and life satisfaction.	Special Article
(Lai et al., 2020)	Older adults with neurocognitive disorder (NCD) and their caregivers	30-min. weekly care service via telephone; weekly health services delivered through video communication apps	30-min. weekly care service via telephone	Deterioration averted, reversed falling trend in quality of life, and improvements in both physical and mental health, perceived burden, and self-efficacy.	Quasi-experimental Design
(Kotwal et al., 2020)	Community-dwelling older adults, aged 60 and older	Observational study. 15-45-minute interview, and follow-up interviews every 2 weeks.	N/A	Social interaction was via telephone (43% daily), video-based socializing (none: 46%; 1-2 times per week: 30%) and Internet-based socializing (none: 26%; 1-2 times per week: 16%). Technology helped to sustain connections with community activities and loved ones. Those with limited social interaction had difficulty navigating technology and felt further excluded and isolated.	Mixed-methods longitudinal phone-based survey
(Gorenko, Moran, Flynn, Dobson, & Konnert, 2021)	Older adults	A comprehensive overview of remotely delivered interventions that target loneliness and psychological symptoms in older adults.	N/A	Social media augmented but did not replace traditional communication modes. Video calls increased overall social, emotional and appraisal support, and reduced overall loneliness and depression. iCBT groups demonstrated significant a reduction in depressive symptoms.	Narrative Review
(Garcia et al., 2021)	Older adults over the age of 55	Educating older adults on how to use ICTs to reduce the digital divide.	N/A	Combats social exclusion/inequalities and improves quality of life for older adults. Reduces social isolation and a loss of autonomy, increases access to information and services, and helps older adults adapt to today's society.	Article
(Sixsmith, 2020)	Older adults	AgeTech (i.e., digital media, ICTs, mobile technologies, wearables)	N/A	Helps older adults keep active and healthy, increases their safety, supports independent living allowing them to age in place, and reduces isolation.	Commentary
(Day, Gould, & Hazelby, 2020)	Older adults	Education in digital technology for older adults	N/A	Helps those who are housebound and socially isolated support themselves and provides them with contact with the outside world. Social engagement is promoted through use of body language and facial expression.	Article
(Conroy, Krishnan, Mittelstaedt, & Patel, 2020)	Older adults	Technological solutions and low-tech approaches to mitigate loneliness	N/A	Addresses loneliness among elderly populations. Aids in the delivery of care and maintenance of social connections.	Research paper
(Chen et al., 2021)	Older adults with pre-frailty and frailty	Qualitative analysis of online discussion data generated by older adults.	N/A	Information and technology use kept participants informed and connected and provides opportunities for social connectedness.	Featured Article
(Ammar et al., 2020)	Older adults	Innovative ICT-based solutions (ICT-COVID-Companion)	N/A	Improved elderly physical and mental health, prevention/dampening of psychosocial strain in older adults, and fosters an Active and Healthy Confinement Lifestyle (AHCL).	Review
(Hoffman, Webster, & Bynum, 2020)	Older adults	In-home acute and primary medical care, use of video telehealth and social interaction, and implementation of intergenerational service.	N/A	Helps older adults stay socially connected, reducing social isolation and loneliness. Welfare benefits, increased formal and informal supports, and development of social capital and cohesion within communities.	Essay

(Continued)

Table 2. *Continued*

Author, Publication Year	Population (P)	Intervention (I)	Comparator (C)	Outcome (O)	Study Design (S)
(McArthur et al., 2021)	Long-term care (LTC) residents	Window visits, technology, and clinical information systems	N/A	Lockdown effects were not statistically significant on depression, delirium, or behavioural problems. Technologies can mitigate the poor mental health outcomes associated with lockdowns.	Special Article
(Bethell et al., 2021)	Long-term care (LTC) residents	Communication technology	N/A	Mixed results: One study found that emotional loneliness and social isolation decreased slightly (but not significantly). Another found emotional and informational support increased slightly (not significantly). Another found significantly higher mean emotional and appraisal support scores, and lower mean loneliness scores.	Scoping Review Article
(Banskota, Healy, & Goldberg, 2020)	Older adults	15 Smartphone Apps	N/A	Potential to improve older adults' quality of life, help them maintain mobility and link them to resources that encourage physical and mental well-being.	Review
(Zamir, Hennessy, Taylor, & Jones, 2020)	Older people	Intergroup "Skype Quiz" Sessions	N/A	Reduces loneliness and social isolation, increases interconnectedness and intra-connectedness, re-gaining sense of self and purpose, and overcome situational loneliness.	Article
(MacLeod et al., 2021)	Older adults	Social networking and telehealth	N/A	Repairs/improves aspects of social connectedness damaged by social distancing. Helps to address older adults' needs and provide them resources during the current pandemic.	Review
(Whitehead & Torossian, 2021)	Older adults	Digital Interaction	N/A	Digital communication is a source of comfort/joy for those fully retired.	Special Issue
(Bethell et al., 2021)	Residents of LTC homes, care homes, and nursing homes	Use of technology to communicate	N/A	Regular videoconferencing with family members contributed to beneficial effects for both social support and loneliness.	Scoping Review
(Wallinheimo & Evans, 2021)	Older adults	Internet use	N/A	Clinical depression decreased and quality of life (QoL) increased as internet usage increased.	Article
(Amundsen, 2021)	Older adults	Digital technologies: internet-based communication tools	N/A	Reduces social isolation and loneliness for older adults, helps them maintain existing relationships, gain a sense of connection and social support, and keep up with hobbies or interests.	Article
(Gallistl, Seifert, & Kolland, 2021)	Older adults in long-term care homes	ICTs	N/A	Only 9.2% of respondents (LTC residents) reported using the Internet to stay in contact with their relatives. Most respondents (99.3%) used the telephone. Half (49%) felt lonely – although digital solutions to combat this loneliness did not seem to be an option.	Opinion
(Rolland, 2020)	Older adults	Social media and tele-technology	N/A	Digital technology facilitates roles for elders (i.e., connecting with grandchildren, volunteering to help the less advantaged, or political activism).	Article
(Juvonen, Schacter, & Lessard, 2021)	Older adults	Connecting electronically with friends	N/A	Greater overall satisfaction with electronic contact with friends was associated with lower levels of loneliness, anxiety, and depressive symptoms.	Special issue

Table 3. Country and journal information from selected studies

Number	Authors	Month/Year	Country of Publication	Journal of Publication	Publisher
1	Xie, B. et al.	July 2020	U.S.	*Journal of Aging & Social Policy*	Routledge: Taylor & Francis Group
2	Seifert, A. et al.	March 2021	Hong Kong, China	*American Journal of Geriatric Psychiatry*	Elsevier Inc.
3	Lai, F. et al.	November 2020	Hong Kong, China	*2020 American Association for Geriatric Psychiatry*	Elsevier Inc.
4	Kotwal, A. et al.	October 2020	U.S.	*Journal of Applied Gerontology*	The American Geriatrics Society
5	Gorenko, J.A. et al.	August 2020	Canada	*Journal of Applied Gerontology*	Southern Gerontological Society
6	Garcia K. R. et al.	March 2021	Portugal	*Educational Gerontology*	Routledge: Taylor & Francis Group
7	Sixsmith, A.	November 2020	Canada	*Quality in Ageing and Older Adults*	Emerald Publishing Limited
8	Day, P. et al.	June 2020	England	*Journal of Community Nursing*	ResearchGate
9	Conroy, K.M. et al.	September 2020	U.S.	*Working with Older People*	Emerald Insight
10	Chen, A.T. et al.	January 2021	U.S.	*Geriatric Nursing*	ScienceDirect
11	Ammar, A. et al.	October 2020	Germany	*Biology of Sport*	Termedia
12	Hoffman, G.J. et al.	May 2020	U.S.	*Journal of Aging & Social Policy*	Routledge: Taylor & Francis Group
13	McArthur, C. et al.	October 2020	Canada	*The Journal of Post-Acute and Long-Term Care Medicine*	Elsevier Inc.
14	Bethell, J. et al.	November 2020	Canada	*The Journal of Post-Acute and Long-Term Care Medicine*	Elsevier Inc.
15	Banskota, S. et al.	April 2020	U.S.	*Western Journal of Emergency Medicine*	California Chapter of the American Academy of Emergency Medicine (Cal/AAEM)
16	Zamir, S. et al.	November 2020	England	*Geriatrics*	Multidisciplinary Digital Publishing Institute
17	MacLeod, S. et al.	May 2021	U.S.	*Geriatrics*	Multidisciplinary Digital Publishing Institute
18	Whitehead, B. R. et al.	February 2021	U.S.	*The Gerontologist*	Oxford University Press U.S.
19	Subudhi, R. et al.	December 2020	India	*Parikalpana : KIIT Journal of Management*	-
20	Wallinheimo, A.-S. et al.	April 2021	England	*Healthcare*	Multidisciplinary Digital Publishing Institute
21	Amundsen, D.	January 2021	New Zealand	*Video Journal of Education and Pedagogy*	Bill Sense
22	Gallistl, V. et al.	May 2021	Austria	*Frontiers in Public Health*	Frontiers Media SA
23	Rolland, J. S.	July 2020	U.S.	*Family Process*	Wiley Online Library
24	Juvonen, J. et al.	June 2021	U.S.	*Journal of Social and Personal Relationships*	SAGE Journals

There are many *positive outcomes* reported due to the implementation of social technology interventions. Among the "Community-dwelling Older Adults" cohort, the positive findings included improved eHealth literacy, access to health care and food, quality of life, and physical and mental health (Banskota et al., 2020; Garcia et al., 2021; Wallinheimo & Evans, 2021; Xie et al., 2020). It also increased accessibility to electronic medical records (EMRs) on an online platform, autonomy, social interaction, overall social, emotional and appraisal support, access to information and services, safety, formal and informal supports, and interconnectedness and intra-connectedness (Kotwal et al., 2020; MacLeod et al., 2021; Xie et al., 2020). Social technology use was associated with reduced health disparities, overall loneliness and depression, social

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isolation, loss of autonomy, psychosocial strain, and anxiety symptoms (Ammar et al., 2020; Amundsen, 2021; Garcia et al., 2021; Gorenko et al., 2021; Hoffman et al., 2020; Juvonen et al., 2021; Sixsmith, 2020; Xie et al., 2020). It helped older adults adapt to today's society, combat social exclusion/inequalities, sustain connections with community activities and loved ones, keep active and healthy, provide contact with the outside world, and enhance delivery of care (Conroy et al., 2020; Day et al., 2020; Garcia et al., 2021; Kotwal et al., 2020; Sixsmith, 2020;). Finally, it supports independent living, allowing them to age in place, maintain mobility, develop social capital and cohesion within communities, create links to resources that encourage physical and mental well-being, re-gain a sense of self and purpose, overcome situational loneliness, repair/improve aspects of social connectedness damaged by social distancing, provide a source of comfort/joy, keep up with hobbies or interests, and facilitate roles for older adults (i.e., connecting with grandchildren, volunteering, or participating in political activism) (Amundsen, 2021; Banskota et al., 2020; Hoffman et al., 2020; MacLeod et al., 2021; Rolland, 2020; Sixsmith, 2020; Whitehead & Torossian, 2021; Zamir et al., 2020).

Among the "Older Adults in LTC" cohort, social technologies were reported to improve social participation, digital inclusion, autonomy, and life satisfaction; mitigate the poor mental health outcomes associated with lockdowns; increase emotional, informational and social support, and emotional and appraisal support scores; and decrease emotional loneliness and social isolation (Bethell et al., 2021; McArthur et al., 2021; Seifert et al., 2021).

Among the "Older Adults with Neurocognitive Disorder" cohort, social technologies improved social participation, digital inclusion, and increased autonomy and life satisfaction (Lai et al., 2020).

Among the "Older Adults with Pre-Frailty and Frailty" cohorts, information and technology use kept participants informed and connected, and provided opportunities for social connectedness (Chen et al., 2021).

There are also *adverse outcomes* that became identified. Among the "Community-dwelling Older Adults" cohort, the negative findings include how those with limited social interaction had difficulty navigating technology and felt further excluded and isolated (Kotwal et al., 2020). Barriers to accessing and using these social technologies also prevented many older adults from adopting Internet-based technology and using it to mitigate social isolation during the pandemic (Amundsen, 2021). A study by Juvonen et al. (2021) noted that if individuals were not satisfied with electronic communication with friends, it may result in emotional distress.

There were no adverse outcomes reported in the study cohorts of "Older Adults in LTC," "Older Adults with Neurocognitive Disorder," and "Older Adults with Pre-frailty and Frailty."

A *neutral outcome* was identified among the "Community-dwelling Older Adults" cohort regarding social media, where it was noted to augment but not replace traditional communication methods (see Table 2) (Gorenko et al., 2021).

Many challenges and limitations were also present, as described in Table 4. Some of the most common challenges included a lack of financial resources to implement the social technologies, comorbidities, and functional impairments hindering social technology use, unreadiness among older adults to access telehealth due to privacy or security concerns, the LTC workforce being unable to interact with residents due to infection control measures, and a lack of proper education on how to use the technologies (Banskota et al., 2020; Bethell et al., 2021; MacLeod et al., 2021; Seifert et al., 2021; Xie et al., 2020).

Thematic Analyses

The results of the rapid review were thematically analysed under five separate themes. A summary of the studies included under each of these themes is presented in Table 4.

Use of social technologies combined with community outreach

Four of the 24 studies examined the use of social technologies combined with community outreach as a solution for improving older adults' mental health during the COVID-19 pandemic (Hoffman et al., 2020; MacLeod et al., 2021; Seifert et al., 2021; Xie et al., 2020).

Positive outcomes of using social technologies combined with community outreach include improved eHealth literacy; access to health care and food; reduced health disparities; and increased accessibility to EMRs, autonomy, social interaction, life satisfaction, social participation, and digital inclusion (Seifert, 2020; Xie et al., 2020). Access to social technologies was found helpful for older adults in staying socially connected by reducing social isolation and loneliness (Hoffman et al., 2020). Additionally, another study reported associated welfare benefits such as increased formal/informal support, social capital, and cohesion within communities. It was indicated that the repair and improvement aspects of social connectedness damaged by social distancing can address older adults' needs while providing them with valuable coping resources during the pandemic (MacLeod et al., 2021) (see Table 3).

One of the biggest challenges of using social technologies combined with community outreach are the financial resources required to fund a well-coordinated implementation while being efficient and ensuring equity and inclusion (Xie et al., 2020). Other challenges include assisting older adults with multiple morbidities and functional impairments, further social exclusion of older adults not using digital technologies for social connection, access to ICTs, digital literacy in older populations, costs of ICTs, and training of staff (Seifert et al., 2021). There lies uncertainty with the breadth of service adoption using telehealth and deconditioning of individuals, which requires changing the law, that is, new reimbursements for intensive rehabilitative services delivered at home under Medicare and Medicaid (Hoffman et al., 2020). More specifically, implementation challenges include unreadiness among older adults to access telehealth due to privacy or security concerns, access to Internet-enabled devices, lack of knowledge using devices/platforms, and hearing or vision impairments (MacLeod et al., 2021) (see Table 4).

Use of remotely delivered interventions to improve older adults' well-being and mental health

Of the 24 studies examined, 14 assessed the use of remotely delivered interventions for improving older adults' well-being and mental health during COVID-19 (Ammar et al., 2020; Banskota et al., 2020; Bethell et al., 2021; Chen et al., 2021; Conroy et al., 2020; Gorenko et al., 2021; Juvonen et al., 2021; McArthur et al., 2021; Rolland, 2020; Sixsmith, 2020; Wallinheimo & Evans, 2021; Whitehead & Torossian, 2021; Zamir et al., 2020).

Positive outcomes of using remotely delivered interventions to improve older adult's well-being and mental health include reduced loneliness because of direct messaging via social media; increased overall social, emotional, and appraisal support; and reduced overall loneliness and depressionbecause of video calls (Gorenko et al., 2021). ICTs helped older adults keep active and healthy, increased their safety, supported independent living, and

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Table 4. Themes

Themes	Articles (author, year)	Intervention Description	Challenges/Limitations
Use of social technologies combined with community outreach	(Xie et al., 2020)	Support from government agencies, for-profit and non-profit organizations, and community volunteers must ensure the accessibility and usability of informatics solutions in older adult populations to help address COVID-19 challenges faced.	Intervention requires financial resources to fund a well-coordinated implementation, being efficient during a crisis while ensuring equity and inclusion.
	(Seifert et al., 2021)	ICTs used to overcome physical distance through digital social connections	Older adults with multiple morbidities and functional impairments, further social exclusion of older adults not using digital technologies for social connection, access to ICTs, digital literacy in older populations, costs of ICTs, training staff.
	(Hoffman et al., 2020)	A framework which prioritizes 1) safe and patient-centered in-home primary and acute care delivery, 2) virtual supports and bridging the digital divide, 3) intergenerational programming, 4) aging-friendly physical and social infrastructures promoting socially cohesive communities.	Uncertain breadth of service adoption using telehealth and deconditioning of individuals. Requires changes to the law, i.e., new reimbursements for intensive rehabilitative services delivered at home under Medicare and Medicaid.
	(MacLeod et al., 2021)	Social networking and telehealth. An approach includes community outreach programs where volunteers call seniors in nursing homes to alleviate social isolation.	Challenges to implementing virtual options include unreadiness among older adults to access telehealth due to privacy or security concerns, access to internet-enabled devices, lack of knowledge using devices/platforms, and hearing or vision impairments.
Use of remotely-delivered interventions to improve older adults' well-being and mental health	(Gorenko et al., 2021)	Video calls, community befriending interventions, interest-based education programs, internet and social media use training and activities, and internet-based cognitive behavioural therapy (iCBT) interventions were explored.	Barriers to implementation included the older adults' attitudes towards technologies, accessibility of the required technologies, experience and skill limitations to technology use, and requirement of involvement of others.
	(Sixsmith, 2020)	AgeTech, which refers to existing and emerging advanced technologies used to keep older adults connected and to deliver health and community services.	Challenges include structural barriers to larger-scale implementation, focusing on crisis management rather than quality of service, and addressing the digital divide.
	(Conroy et al., 2020)	Generalized digital health promoting interventions track, monitor and inform mental health. Integration of technology and behaviour-based interventions. Macro-level policy changes in health systems.	Individual needs and environmental factors must be considered when implementing specific emerging technology tools.
	(Chen et al., 2021)	Using technology to promote connectedness. This includes social technologies to connect with family, online services for activities previously conducted in-person, and teaching others to do tasks they can no longer do (i.e., gardening).	The emergence of ageist discourses contributes to the burden and lack of value in the lives of older adults. The small sample size in the study may limit generalizability.
	(Ammar et al., 2020)	ICT-COVID-Companion: a user-friendly ICT-base companion for pandemics. It uses multimodal techniques to promote physical activity and participation, and a healthy diet, and includes gamification, cognitive training, and mood and sleep modules.	Limited application of digital technologies during COVID-19 management and response, sparse use of ICT-based initiatives toward public health psychosocial support, and a lack of solutions able to provide personalized crisis-oriented healthy behaviour accompaniment.
	(McArthur et al., 2021)	The interRAI LTCF (a standardized assessment tool) was used to examine changes in resident outcomes over time and strategies (such as technology use) used to mitigate negative effects of social isolation.	Obtaining data and using it to guide decision making requires ongoing assessments, which requires adequate personnel to complete and interpret the assessments.
	(Bethell et al., 2021)	Strategies affecting the association between social connection and a mental health outcome: Including use of communication technology	Each LTC home context presents unique challenges and opportunities for implementation. Challenges arise when the LTC workforce are not able to interact with residents due to infection control measures.
	(Banskota et al., 2020)	The top social networking apps are FaceTime and Skype. Top medical apps (telemedicine) are	Apps designed to enhance physical and mental health are not being used and/or recommended.

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Table 4. *Continued*

Themes	Articles (author, year)	Intervention Description	Challenges/Limitations
		Teladoc, K Health: Primary Care, and Doctor on Demand.	Older adults have not been well educated in the relative safety and security of these apps.
	(Zamir et al., 2020)	Residents from three care homes built new friendships with each other through a 'Skype on Wheels' intervention where a wheeled device held an iPad.	Organizational issues create barriers to long-term implementation.
	(Whitehead & Torossian, 2021)	Responses referring to social contact via social media, video calls email, phone calls, texts, etc.	The sample is largely homogenous, as there is an underrepresentation of people of color, men, and those over 75 years. This likely influences the sources of stress and joy/comfort reported.
	(Bethell et al., 2021)	Two pilot studies were used. The one intervention included videoconferencing one or more times per week for two months. The other required at least 5 min/week for 3 months, versus regular care only.	There are unique challenges and opportunities for implementation when working entirely with technology to residents, families, and homes.
	(Wallinheimo & Evans, 2021)	The purpose of internet use was to send emails, make video calls, find health-related information, making finances, social networking, reading news, streaming, and finding information on the government.	Internet usage and competency is lower among older adults, thus providing training programs could be beneficial. Data is lacking regarding associations between internet use, mental health, and QoL among older people under lockdown.
	(Rolland, 2020)	Helping elders remain more connected with family members and friends through social media and tele-technology options (e.g., Zoom, Facetime, Skype).	Video calls have shortcomings, which includes complaints from elders that it is not the same as in-person. Lower income families often lack computer resources necessary to use these technologies.
	(Juvonen et al., 2021)	Any electronic communication method that enables social communication between friends.	If individuals were not satisfied with their electronic communication with friends, it may result in emotional distress. The definition of "friend" was not defined in this study.
Use of video conference compared to telephone-only in telemedicine	(Lai et al., 2020)	Both intervention and control groups received a 30-minute telephone call every week covering topics that are relevant to the wellbeing of older adults (i.e., community living, healthy aging, psychosocial needs, and physical wellbeing). The intervention group also received a 30-minute video-conferencing sessions (i.e., through Zoom, WhatsApp, or FaceTime),	The greater benefits of videoconferencing may be attributed to the increased time or frequency of contacts. Switching from phone calls to video conferencing may have affected the health care providers manner of delivery, content, and style, which should have been recorded and analyzed for potential mediator variables. Finally, generalizability is limited as social distancing rules vary across geographical areas and socioeconomic segments.
Frustration and further digital divide resulting from COVID-19	(Kotwal et al., 2020)	Community dwelling older adults aged 60 and older were eligible to participate in a 15- to 45- minute interview conducted over the phone. Follow-up interviews were conducted every two weeks.	Challenges include poor emotional coping and discomfort with new technologies.
	(Amundsen, 2021)	Internet-based communication tools, including Skype, FaceTime, Zoom, WhatsApp, Messenger, and WeChat.	Barriers to accessing and using technology prevents many older adults from adopting internet-based technology and using it to mitigate social isolation during the pandemic. These include financial cost, inappropriate design, lack of experience, low awareness, and concerned attitude or lack of interest.
	(Gallistl et al., 2021)	Digital solutions used to decrease social isolation among older adults, including Skype, FaceTime, or Zoom.	There is often limited ICT infrastructures in LTC facilities, along with lack of ICT skills among staff, and reserved attitude towards technology use.
Use of education on social technologies as a strategy to combat social exclusion/ inequalities	(Garcia et al., 2021)	Facilitating the teaching of digital skills for older adults using digital media, which is facilitated through technical support, family support, and training.	Social and economic inequalities and critical environmental crises act as barriers for scientific and technological discoveries to provide benefits for certain populations.
	(Day et al., 2020)	Education in the use of digital technology for conducting daily activities, social networking, and health information.	Requires access to the internet, equipment and video calling tools.

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Table 4. *Continued*

Themes	Articles (author, year)	Intervention Description	Challenges/Limitations
Legend			
Community-dwelling Older Adults			
Older Adults in LTC			
Older Adults with Neurocognitive Disorder			
Older Adults with Pre-frailty and Frailty			

reduced isolation (Sixsmith, 2020). Information and technological solutions helped address loneliness, aid in the delivery of care, maintain social connections, keep participants informed and connected, and provide older adults with opportunities for social connectedness (Chen, 2020; Conroy et al., 2020). ICT-based solutions also improved older adults' physical and mental health, prevented or dampened psychosocial strain, and fostered an Active and Healthy Confinement Lifestyle (AHCL) (Ammar et al., 2020). According to McArthur et al. (2021), ICTs helped mitigate poor mental health outcomes associated with lockdowns.

Another study conducted by Bethell et al. (2021) found mixed results, suggesting that emotional loneliness and social isolation decreased slightly (but not significantly); however, emotional and informational support increased slightly (but not significantly). It was also found that communication technology was related to significantly higher mean emotional and appraisal support scores and lower mean loneliness scores, with long-term effects in alleviating loneliness. Banskota et al. (2020) determined that smartphone apps could improve older adults' quality of life, help them maintain mobility, and link them to resources that encourage physical and mental well-being. Intergroup "Skype Quiz" sessions, which are 30-minute quiz sessions facilitated through a wheeled device holding an iPad or through Skype TV, were found to reduce loneliness and social isolation and increase interconnectedness and intra-connectedness, regaining a sense of self and purpose and overcoming situational loneliness (Zamir et al., 2020). Digital communication was identified as a source of comfort and joy for those fully retired, and regular videoconferencing with family members contributes to beneficial effects for both social support and loneliness (Bethell et al., 2021; Whitehead & Torossian, 2021). Increased Internet use was associated with decreased clinical depression and increased quality of life (QoL) where digital technology facilitates roles for older adults such as volunteering, connecting with grandchildren, or participating in political activism (Rolland, 2020; Wallinheimo & Evans, 2021). Finally, a study by Juvonen et al. (2021) determined that connecting electronically with friends was associated with lower levels of loneliness, anxiety, and depressive symptoms if they were overall satisfied with their encounter (see Table 3).

Adverse outcomes of direct messaging via social media were associated with passive engagement, which increased loneliness (Gorenko et al., 2021). Barriers to implementation include older adults' attitudes toward technologies, accessibility of the required technologies, experience and skill limitations to technology use, and requirement of the involvement of others (Gorenko et al., 2021). Other challenges include structural barriers to larger-scale implementation, focusing on crisis management rather than the quality of service, and addressing the digital divide (Sixsmith, 2020). When implementing specific emerging technology tools, individual needs and environmental factors must be considered (Conroy et al., 2020). The emergence of ageist discourses contributes to the burden and lack of value in the lives of older adults (K. Chen, 2020). There is limited application of digital technologies during COVID-19 management and response, sparse use of ICT-based initiatives toward public health psychosocial support, and a lack of solutions to provide personalized crisis-oriented healthy behaviour accompaniment (Ammar et al., 2020). Studies reported challenges in obtaining data, and using them to guide decision making requires ongoing assessments, which require adequate personnel to complete and interpret (McArthur et al., 2021). Challenges also arise when the LTC workforce is not able to interact with residents due to infection control measures (Bethell et al., 2021). Apps designed to enhance physical and mental health are not being used or recommended at this time, and older adults have not been well educated in the relative safety and security of these apps (Banskota et al., 2020). Furthermore, studies highlighted that organizational issues create barriers to long-term implementation, and there are also unique challenges and opportunities for implementation when working entirely with technology for residents, families, and homes (Bethell et al., 2021; Zamir et al., 2020). Similarly, studies reported that if individuals are not satisfied with their electronic communication with friends, it can result in emotional distress (Juvonen et al., 2021) (see Table 3).

Use of video conference compared to telephone-only in telemedicine

One of the 24 studies examined the use of video conference compared to telephone-only in telemedicine as a solution for improving older adults' mental health during COVID-19 (Lai et al., 2020).

Positive outcomes of using video conference compared to telephone-only in telemedicine include the aversion to deterioration; reversal of the falling trend in quality of life; and improvements in both physical and mental health, perceived burden, and self-efficacy (Lai et al., 2020) (see Table 3).

Frustration and further digital divide resulting from COVID-19

Three of the 24 studies examined how COVID-19 caused frustration and further digital divide for older adults (Amundsen, 2021; Gallistl et al., 2021; Kotwal et al., 2020).

A positive outcome of using technology was that it helped sustain connections with community activities and loved ones (Kotwal et al., 2020). Those who maintained social interactions

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were reported to have used technology to communicate with others. ICTs were found to reduce social isolation and loneliness for older adults, help them maintain existing relationships, help them gain a sense of connection and social support, and help them keep up with hobbies and interests (Amundsen, 2021). However, only a small percentage (9.2%) of respondents (LTC residents) reported using the Internet to stay in contact with their relatives (Gallistl et al., 2021). Most respondents (99.3%) used the telephone. Half (49%) felt lonely – although digital solutions to combat this loneliness did not seem to be an option (see Table 3).

An adverse outcome of using technology was that those with limited social interaction had difficulty navigating technology and felt further excluded and isolated (Kotwal et al., 2020) (see Table 3).

Overcoming challenges with technology-based social interaction is critical for older adults to address psychological suffering and medical needs (Kotwal et al., 2020). Barriers to accessing and using technology prevent many older adults from adopting Internet-based technology and using it to mitigate social isolation during the pandemic (Amundsen, 2021). These include financial costs, inappropriate design, lack of experience, low awareness, and concerned attitude or lack of interest. Finally, there are often limited ICT infrastructures in LTC facilities, a lack of ICT skills among staff, and a reserved attitude toward technology use (Gallistl et al., 2021) (see Table 4).

Using education in social technologies as a strategy to combat social exclusion/inequalities

Two of the 24 studies examined the use of education on social technologies as a strategy for combatting social exclusion and inequalities (Day et al., 2020; Garcia et al., 2021).

Positive outcomes of using education in social technologies as a strategy to combat social exclusion/inequalities are that it improves the quality of life for older adults, reduces social isolation and a loss of autonomy, increases access to information and services, and helps older adults adapt to today's society (Garcia et al., 2021). Education in social technologies helps housebound and socially isolated individuals support themselves while providing them with contact with the outside world (Day et al., 2020) (see Table 3).

Challenges include social and economic inequalities and critical environmental crises that act as barriers to scientific and technological discoveries to benefit certain populations (Garcia et al., 2021). Other barriers include the requirement of access to the Internet, equipment, and video calling tools (see Table 4).

Discussion

The findings from this rapid review shed light on the significant impact that social technologies have had on the overall outcomes and mental health of older adults during the COVID-19 pandemic. Most studies reported positive findings, where social technologies have improved older adults' mental health during COVID-19 due to their ability to keep them connected to their families and the outside world. On the contrary, some study findings have reported that social technologies may cause an increase in the digital divide among older adults (Amundsen, 2021; Kotwal et al., 2020).

Most studies included in this rapid review used the term *ICTs* as their intervention to encompass a wide variety of social technologies. This generalization may be attributed to the observational and qualitative nature of most studies at this point in the COVID-19 pandemic. Other interventions emphasized the comparison between video calls and telephone calls (Kotwal et al., 2020; Lai et al., 2020; Whitehead & Torossian, 2021). This distinction is essential as many older adults are described to be more comfortable using the telephone over video calls, as video calls require access to the Internet and mobile devices or computers as well as skills necessary to use those devices to make the call (Lai et al., 2020).

The main themes that were derived from the 24 studies include (a) the use of social technologies combined with community outreach; (b) use of remotely delivered interventions to improve older adults' wellbeing and mental health; (c) use of video conference compared to telephone only in telemedicine; (d) frustration and further digital divide resulting from COVID-19; and (e) and use of education on social technologies as a strategy to combat social exclusion/inequalities (see Table 4). Only the fourth theme was associated with adverse outcomes, indicating that social technologies may cause a further digital divide. The author of the study explained how social technologies can present as a barrier for many older adults and create a sense of frustration when unable to function (Kotwal et al., 2020). However, accessing technology was a central factor in coping with COVID-19 restrictions, maintaining social connections, and/or finding assistance for medical needs. These positive findings should not be dismissed, despite the challenges faced during implementation.

The other themes were positive and emphasized social technology's role in helping older adults stay connected with others since they are the most vulnerable population affected by social isolation and are at increased risk of contracting and/or dying because of COVID-19. It was determined that the most popular strategy for staying connected among all cohorts was video calling, which enabled older adults to communicate with loved ones safely without jeopardizing their lives while adding the ability to "see" those they were speaking to (Kotwal et al., 2020; Lai et al., 2020; Whitehead & Torossian, 2021).

Within these five themes comprise four distinct population cohorts: (a) Community-dwelling Older Adults; (b) Older Adults in LTC; (c) Older Adults with Neurocognitive Disorder; and (d) Older Adults with Pre-frailty and Frailty. The findings among each cohort will be discussed further in the next sections.

Community-Dwelling Older Adults

Community-dwelling older adults have experienced both positive and negative experiences during the COVID-19 pandemic (Amundsen, 2021; Hoffman et al., 2020; Kotwal et al., 2020). Having the support of the community when implementing social technologies in their new daily life, using remotely delivered interventions to improve older adults' well-being and mental health, and using education on social technologies as a strategy to combat social exclusion/inequalities were three important *positive* themes (as described above) found under this cohort.

Due to the limited supply of care staff during the pandemic, community support was leveraged through social technologies (e.g., NextDoor, which is a social media platform that provides social networking services for neighbourhoods) to help increase this supply to support the large demand of care needed among older adults (Hoffman et al., 2020). This helped alleviate some of the burdens on the health care system and distribute it more holistically across the community at large (Hoffman et al., 2020; MacLeod et al., 2021; Xie et al., 2020). This also helped improve social connections between the community and helped decrease excess mortality (Hoffman et al., 2020). While considering environmental and socioeconomic factors, along with technological literacy, social technology tools can help address loneliness when

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integrated into crisis communications, public health responses, and care programs (Conroy et al., 2020). These remotely delivered interventions (i.e., Skype and FaceTime) are health-promoting and can improve older adults' mental health (Ammar et al., 2020; Conroy et al., 2020; Gorenko et al., 2021; Juvonen et al., 2021; Rolland, 2020; Zamir et al., 2020). Since many older adults lack digital skills or technology literacy, education on these tools has been important during the COVID-19 pandemic (Day et al., 2020; Garcia et al., 2021). Education is also used as a method to decrease the social and economic inequality gap among older adults to improve the benefits received by these populations (Garcia et al., 2021). These findings are in line with a study by Xie et al. (2022), that determined that older adults' positive attitudes toward having to adapt to new COVID-19 restrictions were a key factor in having positive experiences during the pandemic. This included using technology to keep routines and maintain their lifestyles.

A negative finding among the community-dwelling older adults cohort found that some were frustrated and felt further divided from the population during the pandemic as they lacked the necessary skills or access to use these social technologies (Amundsen, 2021; Kotwal et al., 2020). According to a study by Xie et al. (2022), some older adults were dissatisfied with having to alter their routines and adopt new lifestyle changes, where they felt bored, isolated, and powerless. Having to adapt to the COVID-19 pandemic's restrictions, while also having to learn how to use and incorporate social technologies into daily living, brought a lot of changes at once for this population, possibly leading to this dissatisfaction.

Older Adults in LTC

A subgroup population discussed in some studies focused on LTC residents, which is the second cohort described above. The COVID-19 pandemic has presented an unprecedented challenge for LTC homes (Bethell et al., 2021). LTC homes have had to mitigate the risk of COVID-19 transmission among a highly vulnerable resident population through an increased focus on infection prevention and control (Bethell et al., 2021). Residents in LTC homes experienced poor mental health outcomes due to isolation during the COVID-19 pandemic (McArthur et al., 2021). These outcomes included but were not limited to depression, anxiety low self-esteem, responsive behaviours, and delirium (Bethell et al., 2021; Gallistl et al., 2021). Strategies such as video chats and window visits were used to mitigate these adverse outcomes by keeping residents connected to their family members and community as well as engaged in activities that are meaningful to them (McArthur et al., 2021). In LTC homes, video calls were utilized frequently so that residents and family members could "see" each other during a time when visitor restrictions were in place (Gallistl et al., 2021). However, most residents were not able to utilize or access the ICTs themselves, thus assistance was necessary. These technologies have become very important tools to support resident and family connections since LTC homes experienced visitor restrictions as a means of keeping residents safe (Gallistl et al., 2021). Ensuring that LTC residents have mental health support and access to social technologies is critical to their health and well-being (Canadian Coalition for Seniors' Mental Health, 2021).

During the early waves of the pandemic, one of the key strategies to decrease the risk of contracting COVID-19 for residents was to suspend all visitors to LTC homes (Chu, Yee, & Stamatopoulos, 2022). This measure effectively decreased the risk of transmission; however, it also led to loneliness and isolation among residents. Many residents enjoyed regular visits from friends and family, and the sudden stop to this important socialization had a significant impact on residents (Seifert et al., 2021). The sudden suspension of visits also had a significant impact on friends and family who missed the opportunity to regularly connect with the resident and to feel assured that the resident was well and well cared for. These impacts led to significant harm to residents psychologically, physically, and socially (Chu et al., 2022).

To address the challenge of social isolation, staff in LTC homes should meet with each resident or their substitute decision maker to determine the most appropriate modality to support ongoing socialization and connection (Bethell et al., 2021). Options included traditional telephone calls, window visits, and video conferencing (Gallistl et al., 2021; Kotwal et al., 2020). An important barrier to implementation included resident, family, and staff hesitations to attempt video conferencing, citing limited technology skills and concerns that residents with cognitive impairment may not respond well to video conferencing (Macchioni & Prandini, 2022). Strategies must be put in place to ensure that social technologies are quickly adopted by LTC residents, families, and staff (Bethell et al., 2021). Staff should meet with each interested family member to ensure that they have a device at home and video conferencing capacity set up on their device. Staff at LTC homes may be required to re-organize their daily routine to include setting up a schedule to support all the residents who; would require assistance to have a video conference (Macchioni & Prandini, 2022). Staff should support each resident and family member interested in exploring video conferencing, as video conferencing became a lifeline during the pandemic for residents to stay connected with their loved ones, while supporting overworked LTC staff (Chu, Ronquillo, Khan, Hung, & Boscart, 2021; Eghtesadi, 2020).

Older Adults with Neurocognitive Disorder

A special subset of LTC residents lives with cognitive impairment or dementia, which impacts their potential effective use of ICTs. This study categorized this cohort under "Older Adults with Neurocognitive Disorder." A study by Lai et al. (2020) required that caregivers were present during video conferences to aid these residents and surmount this significant barrier. By ensuring that older adults with NCD received caregiver-assisted video communication calls, it was found that deterioration was averted, the falling trend in the quality of life of these older adults reversed, mental and physical health improved, perceived burdens diminished, and self-efficacy improved (Lai et al., 2020). Social technology use through video conferencing has thus proven to deliver important benefits to this cohort compared to regular telephone calls and has allowed older adults with NCD to have improved resilience and quality of life during the COVID-19 pandemic (Lai et al., 2020). It was found that having video calls and "seeing" others allowed this cohort to properly capture critical social elements, which cannot be realized over the phone. The value of social technologies should thus not be underestimated by policy makers and decision makers when valuing the cost of these technologies relative to the potential outcomes.

Older Adults with Pre-Frailty and Frailty

Finally, the last cohort of "Older Adults with Pre-frailty and Frailty" displayed a positive association between ICT use and social support and connectedness, and reduced isolation among this population

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(Chen et al., 2021). These outcomes are a result of the family and friends' connection maintained by online videoconferencing applications. The pandemic had negatively impacted this population by making this population feel especially isolated, where they lacked frequent visits from their family and friends (Chen et al., 2021). This cohort also noted how they learned valuable health information from family and friends through video conferences, which was important in staying physically safe and healthy during the COVID-19 pandemic.

Due to the current unfolding of COVID-19, most study designs included in this review were qualitative or observational. This provided us with valuable insights and a more flexible approach to determining the impact that social technologies have on the mental health of older adults. Unfortunately, there are not yet many experimental studies, which has limited the ability to compare social technology interventions with a control group to provide reproducible settings for LTC facilities to duplicate. More research is required to determine how implementing ICTs will lead to cost savings and improved mental health outcomes for their residents (see Table 4).

Policy Implications

This rapid review enabled the rapid synthesis of a disparate evidence base during an ongoing pandemic to help policy makers and LTC facilities be aware of the evidence available regarding social technologies and the associated benefits for older adults.

It is important to note that in LTC, most residents would not have the knowledge or ability to utilize these technologies independently, therefore support and assistance must be provided by staff to ensure that these virtual visits are provided and prioritized (Seifert et al., 2021). Recreation staff must change their programming format to ensure that these family connections are a priority.

It would be important to determine whether the supplies available in each LTC home as well as the technology to support these interventions were already in place prior to the pandemic or whether they were added throughout due to increased need. Use of technology products such as iPads can be utilized for a variety of different programming options other than video calling and therefore add impact and great value from a programming perspective.

In addition, staffing levels in LTC facilities must be addressed so that residents can be provided with the level of care that they require and deserve on an ongoing basis. ICT is only one small, however, important area that could benefit from additional staff support, as residents living in LTC deserve the opportunity to stay connected during the current COVID-19 pandemic and have opportunities to improve their quality of life moving forward.

There are financial implications for health system administrators and planners for future investments in social technologies. More research is needed to assess the costs as well as cost-effectiveness of social technologies in LTC settings, and the impact these may have on the Canadian health care system.

Limitations

Quantitative data synthesis was not generated due to time constraints and a lack of quantitative data available. Because of this, relevant articles may have been missed. Since the COVID-19 pandemic is ongoing, many unknowns exist regarding the long-term prognosis and effect of the virus, which could not be captured in this review.

Another limitation was the sparse data availability on the impact of social technologies on LTC residents. The initial intent was to focus on LTC residents; however, most studies generally explored outcomes and effects on older adults. More research on LTC home restrictions and regulations is required to understand the full extent of the benefits and consequences of social technology implementation in LTC homes.

Both "Older Adults with Neurocognitive Disorder" and the "Older Adults with Pre-frailty and Frailty" cohorts included only one study each due to a lack of study availability. Including more studies within these cohorts is necessary to truly determine how social technologies impacted older adults' mental health in these cohorts.

It is important to note that the cohorts may not be mutually exclusive. For example, residents in LTC homes may also include older adults with co-morbidities and complex health care needs, which act to impair their ability to stay socially connected (Bethell et al., 2021).

The age range for older adults may have been defined differently for each study. This inconsistency may have had an impact on the results for different population cohorts.

The risk of bias was not assessed for each included study in the review. This may have impacted the transparency of evidence synthesis results and findings and thus resulted in bias within the review.

Cost/economic evaluation was a search concept used in each database, although not used in data synthesis and analysis. This term was ignored in the analysis as none of the included papers in the study contained an economic evaluation of social technologies. This may be due to the recency of COVID-19 and therefore a lack of studies evaluating the costs and outcomes of social technologies on older adults' mental health.

This review was not registered nor was the protocol published due to the rapid turnaround time with evidence generation.

Future Studies

Future studies should consider the cost-effectiveness of using social technologies to aid older adults' mental health during the COVID-19 pandemic and beyond and to determine whether they outweigh the benefits they create – precisely, determining how the costs associated with poor mental health outweigh the costs of the social technologies themselves (i.e., using quality of life indicators). This knowledge would help researchers generate evidence to be used by LTC stakeholders to inform resource allocation and funding decisions, as increased budgets to provide additional technology in LTC would be well received and utilized. It could also guide future economic studies evaluating the cost-effectiveness of social technology devices.

Key Points

- The use of social technologies in improving older adults' mental health during COVID-19 has led to positive, adverse, and neutral outcomes.
- Positive outcomes of using social technologies to improve the mental health of older adults include reduced loneliness; isolation and health disparities; and increased autonomy, social interaction, life satisfaction, and digital inclusion.
- Social technologies can improve mental health outcomes of older adults by mitigating loneliness and isolation due to the COVID-19 pandemic.

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- The COVID-19 pandemic has furthered the digital divide for some older adults as they are frustrated and feel incapable of using or accessing social technologies to stay connected with their loved ones.

Conclusion

The findings from this review highlight the different social technologies used by community-dwelling older adults, older adults in LTC settings, older adults with neurocognitive disorder, and older adults with pre-frailty and frailty, along with the challenges associated with their implementation and the associated outcomes and impact on mental health. With increasing loneliness and isolation among older adults during the COVID-19 pandemic, there has been increased usage of social technologies to help mitigate the resulting poor mental health outcomes (AGE-WELL Network of Excellence (NCE), 2021). The government, LTC facilities and programs, and other relevant decision makers would benefit from understanding which social technologies have significant evidence in improving mental health outcomes. This evidence will help determine how social technologies can improve older adults' mental health during COVID-19 and hopefully stimulate further research on ICT's cost-effectiveness.

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