

Older Adults and Social Isolation and Loneliness During the COVID-19 Pandemic: An Integrated Review of Patterns, Effects, and Interventions

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Article

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Résumé

Une étude de la portée a été menée pour recenser les modèles, les effets et les interventions visant à lutter contre l'isolement social et la solitude de personnes âgées vivant dans la communauté pendant la pandémie de COVID-19. Cette étude a aussi intégré : 1) les données de l'Étude longitudinale canadienne sur le vieillissement (ÉLCV) et 2) une analyse de la littérature grise canadienne sur des interventions réalisées au cours de la pandémie. Les données de l'ÉLCV ont permis de mettre en évidence des augmentations relatives estimées de la solitude allant de 33 % à 67 % selon le groupe d'âge ou le sexe. Des études internationales ont également rapporté un accroissement des niveaux de solitude pendant la pandémie, ainsi que de fortes associations entre la solitude et la dépression. Les études recensées ont principalement mis l'accent sur l'utilisation d'interventions basées sur la technologie pour réduire l'isolement social et la solitude. L'application de modèles socioécologiques et de résilience suggère que les chercheurs auraient avantage à explorer un éventail plus large d'interventions potentielles adaptées aux personnes âgées (p. ex. activités de plein air, programmes intergénérationnels et autres interventions de proximité) et d'approches fondées sur les forces (p. ex. renforcement des capacités de la communauté et du système) qui pourraient contribuer à la réduction de l'isolement social et de la solitude.

Abstract

A scoping review was conducted to identify patterns, effects, and interventions to address social isolation and loneliness among community-dwelling older adult populations during the COVID-19 pandemic. We also integrated (1) data from the Canadian Longitudinal Study on Aging (CLSA) and (2) a scan of Canadian grey literature on pandemic interventions. CLSA data showed estimated relative increases in loneliness ranging between 33 and 67 per cent depending on age/gender group. International studies also reported increases in levels of loneliness, as well as strong associations between loneliness and depression during the pandemic. Literature has primarily emphasized the use of technology-based interventions to reduce social isolation and loneliness. Application of socio-ecological and resilience frameworks suggests that researchers should focus on exploring the wider array of potential pandemic age-friendly interventions (e.g., outdoor activities, intergenerational programs, and other outreach approaches) and strength-based approaches (e.g., building community and system-level capacity) that may be useful for reducing social isolation and loneliness.

Introduction

The new Coronavirus (COVID-19) is a highly contagious disease that was discovered near the end of 2019. The rapid and ubiquitous spread of COVID-19 has produced a global pandemic that has created new challenges for public health, continuing and long-term care (LTC) systems, community support organizations, businesses and the economy, families, and individuals. COVID-19 has been conceptualized as a “gero-pandemic”, defined as a disease that has spread globally with heightened significance and deleterious consequences for older populations (Wister & Speechley, 2020). This has raised the profile of aging-related pandemic challenges facing societies and older individuals.

As of the end of January 2022, COVID-19 cases surpassed 2,900,000 in Canada and 364,000,000 worldwide. The number of deaths has passed 33,000 in Canada and has exceeded 5,600,000 globally (Government of Canada, 2022). Approximately 15% of positive cases are among persons 60 years of age and older, and over 90% of deaths are among this age group (Government of Canada, 2022). Furthermore, residents of long-term care facilities account for approximately 3 per cent of COVID-19 cases and 43 per cent of deaths (Canadian Institute for

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Health Information, 2021). Yet, those living in the community also face risk of infection, and the effects of the pandemic response (Cohen & Tavares, 2020).

Although age has become a major focal point in the pandemic (Morrow-Howell, Galucia, & Swinford, 2020; Shahid et al., 2020), there are also other aspects that result in increased risk of and vulnerability to pandemic social isolation and loneliness among older persons. These include mental health or lowered psychological well-being (Alonzi, La Torre, & Silverstein, 2020; Barber & Kim, 2021); physical health conditions (e.g., cardiovascular disease, cancer, diabetes, obesity, and chronic obstructive pulmonary disease) (Mauvais-Jarvis, 2020; Mitra et al., 2020); and multimorbidity (Wister, 2021a, b; Wong et al., 2020). Also at increased risk are individuals who are marginalized as a result of poverty; sexual orientation; race, ethnicity, or culture; immigration status; rural/remote environment; or other vulnerabilities (Alonzi et al., 2020; Wister, 2021a, b).

To reduce the spread of COVID-19, governments have implemented public health measures such as physical/social distancing recommendations, closure of non-essential businesses and public spaces, implementation of lockdowns and stay at home orders, mask mandates, travel restrictions, and restrictions on visitors to LTC facilities. Although these measures have resulted in some successes in reducing transmission of COVID-19, concerns have been raised about the potential negative impacts of the prolonged periods of physical/social distancing and reduced social interactions, with specific attention paid to impacts on older adults (e.g., Morrow-Howell et al., 2020; Smith, Steinman, & Casey, 2020). In pandemic research social distancing has been associated with social isolation in community-dwelling older adult populations (Adepoju et al., 2021). Smith et al. (2020) use the term “COVID-19 Social Connectivity Paradox” to refer to the paradox that meaningful interactions and social connections are important for the health of older adults, yet pandemic restrictions require older adults to avoid friends, family, and sources of social support.

Indeed, it is well established that social isolation is a common public health concern among community-dwelling older adults, which has been exacerbated by the pandemic, in particular physical/social distancing measures (Shahid et al., 2020). Pre-pandemic literature has demonstrated that social isolation and loneliness among older adults increases morbidity and mortality; reduces the ability to engage in healthy behaviours; increases anxiety, depression, and stress; decreases health-related quality of life, psychological well-being, and happiness; and results in lower access to health care services and lower health care utilization (Burholt et al., 2020; Courtin & Knapp, 2017; Fakoya, McCorry, & Donnelly, 2020; Golden et al., 2009; Kirkland et al., 2015; Leigh-Hunt et al., 2017; National Seniors Council, 2014a, b; 2016; Newall, McArthur, & Menec, 2015; Wister, Cosco, Mitchell, Menec, & Fyffe, 2019; Wister, Menec, & Mugford, 2018).

Therefore, this article addresses current knowledge about the effects of social isolation and loneliness on community-dwelling older adults during the COVID-19 pandemic through the combination of a scoping review, grey literature scan, and new data, given that the research in this area is in its formative stages. We utilize a spectrum of international academic literature, given the dearth of Canadian literature. To add a Canadian perspective to the article, we also include analysis of data on the prevalence of loneliness among older Canadians from the Canadian Longitudinal Study on Aging (CLSA). Also, because of the fast-paced and dynamic nature of the pandemic, we incorporate a scan of Canadian grey literature on pandemic interventions. Data are presented on the extent of the

problem, risk and protective factors (that either increase or decrease the likelihood of social isolation and/or loneliness), effects on older adults, and strategies and interventions that have been recommended or implemented to reduce social isolation and loneliness among older adults during the pandemic.

Defining Social Isolation and Loneliness Among Older Adults

Social isolation is commonly defined as “a lack in quantity and quality of social contacts” and “involves few social contacts and few social roles, as well as the absence of mutually rewarding relationships” (Keefe, Andrew, Fancey, & Hall, 2006, p.1). A concept closely related to social isolation is loneliness “defined as a distressing feeling that accompanies the perception that one’s social needs are not being met by the quantity or especially the quality of one’s social relationships” (Hawkey & Cacioppo, 2010, p.1). The key distinction between social isolation and loneliness is that social isolation refers to the objective level of social connections, whereas loneliness reflects the perception of being disconnected from others (Courtin & Knapp, 2017). An example of a common instrument to measure loneliness is the UCLA-3 Loneliness Scale (and its longer version), consisting of three subjective questions that participants score on a three-point scale (e.g., “How often do you feel that you lack companionship?”) (Hughes, Waite, Hawkey, & Cacioppo, 2004). Social isolation tends to be measured with a broader set of scales. For example, the Abbreviated Lubben Social Network Scale consists of six questions about contact with friends and family (e.g., “How many relatives do you see or hear from at least once a month?”) (Lubben et al., 2006). Although loneliness and social isolation often overlap, there can be unique associations; for instance, some older adults may not feel lonely even if they have low levels of social connectedness, and some people who have many social contacts feel lonely.

Conceptual Framework

Two complementary models are useful in framing social isolation and loneliness among older adults during the pandemic. Socio-ecological (or socio-environmental) (SE) theory posits that individuals, social systems, and the environment are interrelated and interdependent (Bronfenbrenner, 1994; Stokols, 1992; 2017). Thus, the SE framework differentiates and connects each of the nested ecological domains (e.g., individual, interpersonal, organizational, neighbourhood, municipal, health regional, provincial, country, and global levels) to understand aging experiences. The SE framework has been applied as a useful conceptual framework in the areas of housing (Lawton, 1980), homelessness (Canham, O’Dea, & Wister, 2019), green spaces and walkability (Chaudhury et al., 2011), healthy public policy (Wister & Speechley, 2015), and recently, COVID-19 (Andrew et al., 2020). For example, in a study of frailty and LTC, Andrew et al. (2020) identify COVID-19 risk, vulnerabilities, and responses at the individual level (e.g., pre-existing conditions); family level (e.g., policies limiting physical contact with relatives in LTC); community level (e.g., making public transportation systems less risky to use); and policy level (e.g., increased funding for pandemic response). Figure 1 provides an illustration of how the SE framework can be applied to the issue of social isolation and loneliness during the pandemic.

A second framework that directly builds on and extends the SE framework, adding a new dimension to understanding the pandemic, is a complex systems resilience framework that stems from

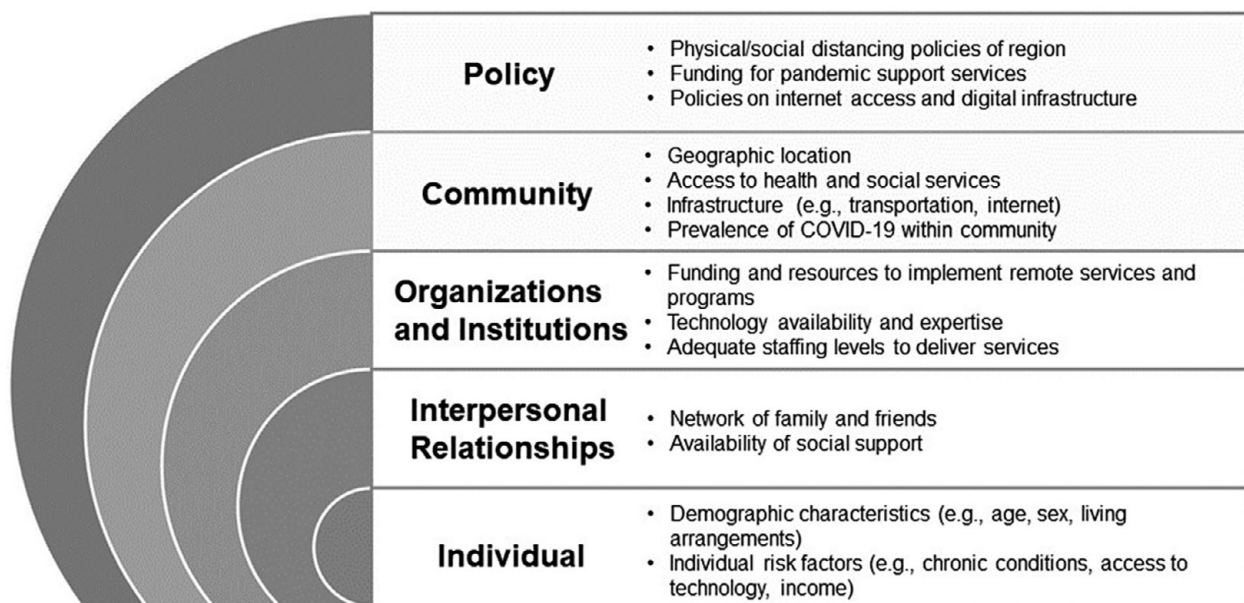


Figure 1. Socio-ecological framework and loneliness and social isolation during the COVID-19 pandemic.

disaster response research (Klasa, Galaitsi, Trump, & Linkov, 2021; Klasa, Galaitsi, Wister, & Linkov, 2021). This framework attempts to: (1) link and quantify the different individual and environmental-level spheres of influence observed within the existing SE framework, and (2) apply a resilience lens whereby focus is placed on how and why individuals and systems respond to adversity (see Klasa, Galaitsi, Trump & Linkov, 2021 and Klasa, Galaitsi, Wister & Linkov, 2021 for a full description of this model). According to the National Research Council (2012), the ability of a system to adapt to, plan with regard to, recover from, and absorb adversity represents four key resilience processes. These have been applied to structural systems, individuals, and families.

This framework has also been applied to COVID-19 (Klasa, Galaitsi, Trump & Linkov, 2021; Linkov, Keenan, & Trump, 2021). First, planning and preparing for adverse or stress-inducing events, such as the COVID-19 pandemic, requires targeted reductions in risk and vulnerabilities. Pandemic planning necessitates an understanding of the characteristics of the COVID-19 pandemic, such as population susceptibility, severity, and behavioural response. Second, mitigation of outcomes associated with the adversity (e.g., social isolation and loneliness due to COVID-19 physical/social distancing policies) is necessary to produce positive resilience or coping responses. The ability of an individual or system to overcome pandemic adversity is a primary component of resilience. Third, recovery relies on various forms of strength-based resilience embedded in the individual, family, community, and structural system levels. Recovery is essential for counteracting the weakening of any system so that it can respond to future adversity such as a COVID-19 variant infection wave or a different pandemic on the horizon. Finally, a complex systems resilience framework focuses attention on fostering the strengths of individuals, families, and communities; for example, some Indigenous reserve communities have utilized strong community connections and leadership to support pandemic mitigation strategies even though health care resources tend to be weaker (National Collaborating Centre for Methods and Tools & National Collaborating Centre for Indigenous Health, 2020). The complex systems resilience framework helps to identify the weaknesses and strengths in nested ecological

systems that influence risk and response to social isolation among older adults during the pandemic (Klasa, Galaitsi, Wister & Linkov, 2021; Pearman, Hughes, Smith, & Neupert, 2021; Wister, Klasa & Linkov, 2022).

Methods

CLSA Data

The CLSA is a national, longitudinal study that aims to follow 50,000 Canadians 45 years of age and up for 20 years (see Raina et al. 2009; 2019; for more details). In order to estimate the increase in loneliness during the pandemic, we use unique data drawn from three separate waves of the CLSA. CLSA Baseline data (collected 2011–2015; *n* = 51,338); Follow-up One data (collected 2015–2018; *n* = 44,817); and data from the CLSA COVID-19 Study (collected April to December, 2020; *n* = 28,559) are employed. Loneliness is measured in all surveys using an identical measure derived from the single loneliness item from the Center for Epidemiologic Studies (CES)-D depression scale. Participants who reported being lonely some of the time, occasionally, or all of the time were deemed to be lonely (compared with those who reported being lonely rarely/none of the time). At the time of writing this article, only the COVID-19 Baseline survey data were available, and only in secondary descriptive form on the CLSA Web site (www.clsa-elcv.ca/) (i.e., not available for analysis and/or linkage to the other CLSA surveys). Therefore, the surveys are employed as individual samples showing age-sex patterns in loneliness for two pre-pandemic periods and one early pandemic survey, albeit with different sample sizes as a result of attrition and non-response.

Scoping Review Methods

The literature review followed the five steps outlined by Arksey and O’Malley (2005) for scoping reviews: (1) identify the research question, (2) identify relevant studies, (3) select relevant studies, (4) chart the data, and (5) collate, summarize, and report the results.

The research questions guiding the review were:

1. How has the pandemic impacted patterns of social isolation and loneliness among older adult populations internationally?
2. What effects have experiences of social isolation and loneliness had on older adults during the pandemic?
3. What strategies and interventions have been recommended to reduce the social isolation and loneliness of older adults during the pandemic?
4. What interventions have been implemented to reduce the social isolation and loneliness of older adults during the pandemic?

An initial search of English-language literature from academic journals was conducted the week of January 11, 2021, using the search engine Ebscohost. Ebscohost can search multiple databases simultaneously (e.g., AgeLine, Cumulative Index to Nursing and Allied Health Literature [CINAHL], MEDLINE[®], Social Sciences, PsycInfo, Academic Search Premier). Because of the fast-paced and changing nature of the pandemic, two supplementary searches were conducted the weeks of February 15 and March 8. The keywords used in the searches were social isolation OR loneliness, AND older adults (or synonyms) AND COVID-19 (or synonyms).

Articles were included in the review if they focused on one of the following subjects: (1) patterns (e.g., prevalence, changes, associated factors, effects) of social isolation or loneliness among older adult populations during the COVID-19 pandemic; or (2) strategies or interventions (recommended or implemented) to reduce social isolation or loneliness among older adult populations during the COVID-19 pandemic. For category (2), non-empirical academic literature (e.g., commentaries, descriptions of programs) were considered for inclusion given the paucity of empirical literature. Articles were excluded if they met any of the following exclusion criteria: (1) not written in English, (2) did not focus on a community-dwelling older adult population (articles that included multiple age groups were retained if there was deemed to be sufficient analysis/findings focusing on older age groups), (3) not related to social isolation and/or loneliness, or (4) did not focus on the COVID-19 pandemic context.

As shown in Figure 2, a total of 67 articles were included in this review based on the inclusion and exclusion criteria. Given the expected lag between implementation of interventions during the pandemic and publication of journal articles, a supplementary scan

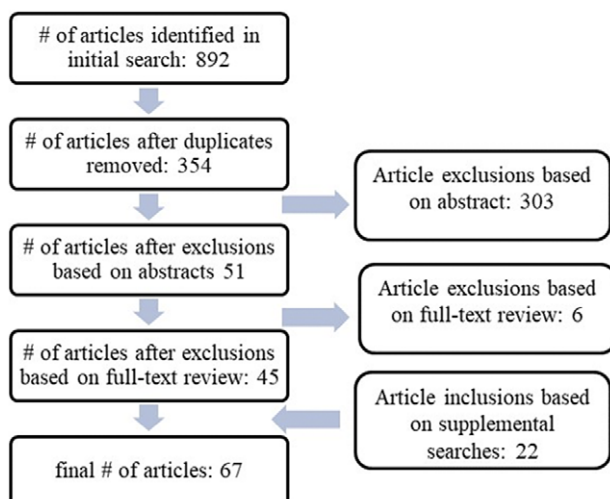


Figure 2. Literature search strategy.

of Canadian grey literature (e.g., newspapers, organizational Web sites, and reports) was undertaken between February and March of 2021 to identify common types of interventions being implemented in Canada during the pandemic. Most interventions were identified via news stories through a Google search of the news, using the keywords social isolation OR loneliness AND older adults OR seniors AND Canada. Web sites of organizations serving older adults that were known to the authors were also searched for information on programs (e.g., Healthy Aging CORE BC, A & O).

Results

Patterns of Loneliness in the CLSA during the Pandemic

Table 1 presents descriptive data on percentages of CLSA participants feeling lonely. Using pre-pandemic cross-sectional data at CLSA Baseline (2011–2015), among older women 65–74 years of age we observed that 25 per cent reported feeling lonely, whereas among women 75–84 years of age, a total of 31 per cent reported feeling lonely. For men, the rates were lower for these same age groups, where 18 and 19 per cent reported being lonely, respectively. The rates for the CLSA Follow-up One (2015–2018) were almost identical to Baseline levels, with only men 75–84 years of age showing a slight rise from 19 to 23 per cent being lonely. Turning to the CLSA COVID-19 Study (2020), the absolute percentages increased significantly. Among women 65–74 years of age, 41 per cent reported feeling lonely, with 42 per cent among those 75–84 years of age reporting feeling lonely. For men, the percentages also increased, but were lower than for women. Among men 65–74 and 75–84 years of age, 26 per cent felt lonely at least some of the time.

The relative rate increase in loneliness (percentage change between CLSA Baseline and COVID survey time periods, divided by CLSA Baseline percentage) was striking. There was a 67% increase in loneliness for women 65–74 years of age, and a 37 per cent increase for those 75–84 years of age. Smaller increases were observed for men, for whom there was a 45 per cent relative rise for those 65–74 years of age and a 33 per cent relative increase for the oldest group (see Table 1).

Patterns of Social Isolation and Loneliness Internationally during the Pandemic

The complex systems resilience framework outlines the need to understand the characteristics of a problem, factors that contribute to vulnerabilities and resilience, and the effects of the problem. In the international literature, a total of 38 articles were identified that reported on patterns of social isolation and loneliness during the pandemic (prevalence and changes, factors, effects). Most articles reported on multiple types of patterns: 22 reported on prevalence or changes in patterns of social isolation and/or loneliness during the pandemic, 24 on associated factors, and 14 on the effects of social isolation or loneliness on older adults. A wide variety of instruments were used in the studies to measure social isolation and loneliness, and some of the measurements utilized were unvalidated or differed from typical measurements for the concept (e.g., reporting on social isolation based on an objective perception). We have reported these findings based on the conceptualization used by the authors. Most studies were cross-sectional ($n = 25$) or longitudinal ($n = 10$). There were two hybrid studies that used both cross-sectional and longitudinal data. Only one relevant qualitative study was identified.

Table 1. Loneliness patterns by age and sex, baseline (2011-2015), Follow-up One (2015-2018), and during pandemic (2020), CLSA

	Baseline (2011-2015), CLSA			
	Ages 65-74		Ages 75-84	
	Women	Men	Women	Men
Lonely at least some of the time ^{a,b}	25%	18%	31%	19%
	Follow-up One (2015-2018), CLSA			
	Ages 65-74		Ages 75-84	
	Women	Men	Women	Men
Lonely at least some of the time ^{b,c}	25%	17%	33%	23%
	During Pandemic (2020), CLSA			
	Ages 65-74 ^e		Ages 75-84 ^e	
	Women	Men	Women	Men
Lonely at least some of the time ^{b,d}	41%	26%	42%	26%
	Changes in Loneliness Between Baseline and COVID-19			
	Age 65-74		Age 75-84	
	Women	Men	Women	Men
Absolute percentage increase in loneliness	17%	8%	11%	6%
Rate of increase in loneliness	67%	45%	37%	33%

Note. All percentages have been rounded.

^aData drawn from Wister et al., 2018.

^bIncludes: All of the time, Occasionally, and Some of the time responses compared with Rarely/None of the time.

^cGenerated from Follow-up One CLSA data by authors.

^dGenerated from the CLSA COVID-19 Study, CLSA Data Centre, McGill University.

^eOnly includes these ages (65-74 and 75-84) to compare with baseline and follow-up ages.

Prevalence and Changes in Levels of Social Isolation and Loneliness

Twenty-two studies reported on patterns of social isolation and/or loneliness among older adult populations during the pandemic. The majority originated in the United States ($n = 8$) or European countries ($n = 10$) (see Table 2 for an overview of the studies and their findings).

In studies that reported on the prevalence of loneliness during the pandemic ($n = 12$), results ranged from 13 to 66 per cent of community-dwelling older adults (Brown et al., 2021; Choi, Farina, Wu, & Ailshire, 2021; Emerson, 2020; Gaeta & Brydges, 2020; Herrera et al., 2021; Kobayashi et al., 2021; Kotwal et al., 2021; Mistry et al., 2021; Robb et al., 2020; Röhr et al., 2020; Stolz, Mayerl, & Freidl, 2021; Strutt et al., 2021). Two additional studies focusing on older adult populations with chronic conditions reported even higher rates of loneliness, with 66 per cent (Polenick et al., 2021) and 70 per cent (Wong et al., 2020) found to be lonely, respectively. In addition, in three cross-sectional studies, participants were asked whether they believed that their levels of loneliness had worsened during the pandemic; positive responses range from 21 to 50 per cent (Emerson, 2020; Gaeta & Brydges, 2020; Lehtisalo et al., 2021).

Most of the longitudinal studies comparing levels of loneliness pre and peri-pandemic reported that levels of loneliness increased during the pandemic. Studies from the United States (Krendl & Perry, 2021), Switzerland (Macdonald & Hülür, 2021), Netherlands (Van Tilburg, Steinmetz, Stolte, van der Roest, & de Vries, 2020), and Hong Kong (Wong et al., 2020) reported greater levels of loneliness peri-pandemic than pre-pandemic. In Chile, no statistically significant change in mean loneliness scores was observed, although there was a small increase in the proportion of older adults classified as lonely by the authors based on a dichotomous

classification of loneliness scores (Herrera et al., 2021). A Swedish study found no differences in loneliness between COVID-19 and pre-pandemic data collection points (Kivi, Hansson, & Bjälkebring, 2021). Additionally, an Austrian study compared data from two different cross-sectional samples and reported an increase in loneliness scores during the pandemic (Heidinger & Richter, 2020).

Five longitudinal studies reported data on loneliness collected at multiple points during the pandemic. Kotwal et al. (2021) collected data in the United States over the period from April to June 2020, and levels of severe loneliness ranged from 23 to 36 per cent. Levels of loneliness were highest during the first period of data collection (4-6 weeks after shelter in place orders began). Although levels of loneliness tended to level off over the course of the pandemic, a subgroup of respondents reported persistent or higher rates of loneliness. Luchetti et al. (2020) collected data in the United States between February and April 2020 and similarly found an increase in loneliness that plateaued over time. Another American study by Choi et al. (2021) measured loneliness between April and June 2020, reporting stable levels of loneliness. Stolz et al. (2021) observed a small decline in loneliness levels between the lockdown phase in Austria (March to April 2020) and re-opening (May to June 2020), although levels of loneliness remained above regular levels. In a study from Spain by Losada-Baltar, Martínez-Huertas, et al. (2021), there was an increase in loneliness scores over time (March to May 2020) for both older adults and younger age groups. The leveling or declining of loneliness during the pandemic in most jurisdictions may be indicative of processes of resilience at the individual, social network, and/or community system levels, because older adults appeared to either find ways to cope with restrictions, or increased supports were provided to them through their social and community networks. Loosening of pandemic restrictions in some jurisdictions may also have stabilized or

Table 2. Overview of studies reporting on prevalence and changes in rates of social isolation and/or loneliness

Authors & Country	Study Design	Sample	Measure	Findings
Birditt et al. (2021) USA	Cross-sectional	645 adults (≥ 18)	Single question: Social isolation	Older respondents reported feeling less socially isolated than younger respondents
Choi et al. (2021) USA	Longitudinal (peri-pandemic)	3,253 older adults (≥ 50)	Single question: Loneliness	<ul style="list-style-type: none"> Loneliness levels did not significantly change over time 27% lonely Being younger, female, low-income, and living alone were associated with loneliness, whereas being Black or Hispanic was associated with lower odds Cancelling/postponing social activities and avoiding close contact with people in the household were associated with loneliness
Emerson (2020) USA	Cross-sectional	833 older adults (≥ 60)	Single questions: Loneliness, Change in loneliness, Social contacts	<ul style="list-style-type: none"> 43% lonely and 31% loneliness increased during pandemic 51% no regular contacts outside of the home Living alone was associated with higher levels of loneliness
Fingerman et al. (2021) USA	Cross-sectional	226 older adults (≥ 69)	Multiple ratings of loneliness on a scale of 1-5	Living alone was associated with loneliness and less social engagement
Gaeta & Brydges (2020) USA	Cross-sectional	514 older adults	Single questions: Loneliness, Change in loneliness, and Social isolation	<ul style="list-style-type: none"> 56% isolated and 36% lonely 50% loneliness increased during pandemic COVID-19 anxiety and isolation were associated with loneliness
Kobayashi et al. (2021) USA	Cross-sectional (but follow-up planned)	6,938 older adults (≥ 55)	UCLA-3 Loneliness Scale	<ul style="list-style-type: none"> 29% lonely 69% fully self-isolating over past week Age was negatively associated with loneliness
Krendl & Perry (2021) USA	Longitudinal (Pre and peri-pandemic)	93 older adults	UCLA-3 Loneliness Scale	<ul style="list-style-type: none"> Greater loneliness reported during the pandemic than at baseline Loneliness was associated with higher levels of depression
Kotwal et al. (2021) USA	Longitudinal (Peri-pandemic)	151 older adults (≥ 60)	<ul style="list-style-type: none"> UCLA-3 Loneliness Scale Modified Duke Social Support Index Single question: Change in loneliness 	<ul style="list-style-type: none"> Levels of severe loneliness ranged from 23% to 36% at data collection points Levels of social isolation ranged from 33% to 49% at data collection points 54% reported worsening loneliness at least once during the study period Worsening loneliness was associated with anxiety and depression, but social isolation was not
Luchetti et al. (2020) USA	Longitudinal (Peri-pandemic)	526 older adults (≥ 65)	UCLA-11 Loneliness Scale	<ul style="list-style-type: none"> Increase in loneliness for older adults which levelled off as pandemic progressed Older adults less lonely than younger age groups
Minahan et al. (2021) USA	Cross-sectional	1,318 adults (≥ 18)	<ul style="list-style-type: none"> UCLA-3 Loneliness Scale Measured social isolation using a 9-item instrument 	<ul style="list-style-type: none"> Mean loneliness scores were lowest for the ≥ 65 age group Social isolation was not associated with anxiety or depression
Polenick et al. (2021) USA	Cross-sectional	701 adults with chronic conditions (≥ 50)	UCLA-3 Loneliness Scale	<ul style="list-style-type: none"> 66% moderate or severe loneliness COVID-19 worries and financial strain were associated with higher levels of loneliness, whereas being a person of color, living with a partner, and social support were associated with lower levels
Portacolone et al. (2021) USA	Interviews	24 older adults (≥ 55) living alone with cognitive impairments	Not applicable	Participants reported experiencing extreme isolation and distress due to this isolation
Whatley et al. (2020) USA	Study 1: Longitudinal Study 2: Cross-sectional	Study 1: 86 older adults (≥ 65) Study 2: 115 younger adults	UCLA-3 Loneliness Scale	In both studies, loneliness was associated with unpleasant moods and negative expectations of aging

(Continued)

Table 2. Continued

Authors & Country	Study Design	Sample	Measure	Findings
		(18-30) and 115 older adults (≥ 65)		<ul style="list-style-type: none"> In the second study for older adults, loneliness was also associated with lower health ratings, being female, and lower income
Whitehead & Torossian (2021) USA	Cross-sectional	825 older adults (≥ 65)	Not applicable	In an open-ended question on sources of stress in their life, 11.8% of participants identified social isolation/loneliness as a stressor
Brown et al. (2021) England	Cross-sectional	142 older adults	Single questions: Loneliness, Self-isolation	<ul style="list-style-type: none"> 27% lonely at least some of the time 62% self-isolating
Robb et al. (2020) England	Cross-sectional (but follow-up planned)	7,127 older adults (≥ 50)	Single question: Loneliness	<ul style="list-style-type: none"> 27% lonely (women 35% and men 18%) Loneliness was associated with depression and anxiety
Macdonald & Hülür (2021) Switzerland	Longitudinal (Pre and peri-pandemic)	99 older adults (≥ 65)	Rated levels of loneliness on a 0-100 scale	<ul style="list-style-type: none"> Loneliness levels increased in the lockdown compared to baseline More social interactions and satisfaction with communication were associated with lower levels of loneliness
Lehtisalo et al. (2021) Finland	Cross-sectional	613 older adults (≥ 70)	Single questions: Total isolation, Change in loneliness, Social distancing	<ul style="list-style-type: none"> 48% in isolation or total social distancing 21% worsening loneliness Advanced age and living alone were associated with higher levels of loneliness
Kivi et al. (2021) Sweden	Longitudinal (Pre and peri-pandemic)	1,071 older adults (≥ 65)	Loneliness measure not specified	<ul style="list-style-type: none"> Loneliness showed no changes over the years COVID-19 worries were associated with higher levels of loneliness
Röhr et al. (2020) Germany	Cross-sectional	1,005 older adults (≥ 65)	<ul style="list-style-type: none"> UCLA-3 Loneliness Scale Single question: Social contacts 	<ul style="list-style-type: none"> 13% lonely (men 9% and women 16%) 43% no direct contact with others outside of the home over past week Being female and having to self-isolate were associated with higher levels of loneliness, whereas resilience was associated with lower levels
Heidinger & Richter (2020) Austria	Cross-sectional comparison	2,042 older adults ≥ 60 (pre-pandemic survey) 521 older adults ≥ 60 (pandemic survey)	German version of De Jong Gierveld loneliness scale	<ul style="list-style-type: none"> Increase in loneliness scores observed for peri-pandemic group compared to pre-pandemic During the pandemic, increases in loneliness were observed for older adults living with others but not those living alone
Stolz et al. (2021) Austria	Cross-sectional & Longitudinal (Peri-pandemic)	<ul style="list-style-type: none"> Cross-sectional (COVID-19): 557 older adults (≥ 60) Cross-sectional (Pre-pandemic): 557 older adults (≥ 60) Longitudinal: 338 older adults (≥ 60) 	UCLA-3 Loneliness Scale	<ul style="list-style-type: none"> Loneliness levels higher in pandemic than pre-pandemic Loneliness higher during lockdown phase than during re-opening (decline from 33% to 27%), although re-opening levels were still higher than before pandemic Living alone and reporting more exposures to pandemic restrictions were associated with higher levels of loneliness
Van Tilburg et al. (2020) Netherlands	Longitudinal (Pre and peri-pandemic)	1,679 older adults (≥ 65)	De Jong Gierveld Loneliness Scale	<ul style="list-style-type: none"> Higher levels of social and emotional loneliness during the pandemic than at baseline Personal losses (including reduced social interaction) and COVID-19 worries were associated with higher levels of loneliness, whereas living with a spouse or partner was protective
García-Fernandez et al. (2020) Spain	Cross-sectional	150 older adults (≥ 60)	Loneliness measured based on whether participant lived alone	No association identified between loneliness and depression, anxiety, or acute stress
Losada-Baltar, Martínez-Huertas, et al. (2021) Spain	Longitudinal (Peri-pandemic)	1,549 adults (≥ 18)	Rated levels of loneliness on a 0-10 scale	Changes over time in loneliness scores similar for all ages and linear with an increase over time

(Continued)

Table 2. Continued

Authors & Country	Study Design	Sample	Measure	Findings
Losada-Baltar, Jiménez-Gonzalo, et al. (2021) Spain	Cross-sectional	1,310 people ≥ 18 years of age	Rated levels of loneliness on a 0-10 scale	Younger age and negative self-perceptions about aging were associated with loneliness
Parlapani et al. (2020) Greece	Cross-sectional	103 older adults (≥ 60)	Greek version of De Jong Gierveld loneliness scale	Living alone and intolerance of uncertainty were associated with higher levels of loneliness
Grossman et al. (2021) Israel	Cross-sectional	243 older adults (≥ 60)	UCLA-3 Loneliness Scale	Loneliness was positively associated with sleep problems, and COVID-19 worries and resilience moderated this relationship
Schorr et al. (2021b) Israel	Cross-sectional	201 older adults (≥ 65)	Single question: Loneliness	Loneliness was positively associated with subjective age, and this relationship was mediated by malnutrition
Schorr et al. (2021a) Israel	Cross-sectional	201 older adults (≥ 65)	Single question: Loneliness	Loneliness was positively associated with depression, and this relationship was mediated by malnutrition
Shrira et al. (2020) Israel	Cross-sectional	277 older adults (≥ 60)	UCLA-3 Loneliness Scale	<ul style="list-style-type: none"> Loneliness was positively associated with anxiety, depression, and peri-traumatic stress Associations were stronger for older adults who felt older
Cihan & Gökğöz Durmaz (2021) Turkey	Cross-sectional	130 older adults (≥ 65)	Turkish version of De Jong Gierveld loneliness scale	Factors associated with greater loneliness included older age, being single, living alone, higher education and income, being a relative of a health care worker, and being a relative of someone infected with COVID-19
Kılınçel et al. (2020) Turkey	Cross-sectional	290 older adults (≥ 65)	Turkish version of De Jong Gierveld loneliness scale	Loneliness was positively associated with anxiety
Herrera et al. (2021) Chile	Longitudinal (Pre and peri-pandemic)	720 older adults (≥ 60)	<ul style="list-style-type: none"> UCLA-3 Loneliness Scale Lubben Social Network Scale 	<ul style="list-style-type: none"> No statistically significant change in loneliness scores, but a small increase in % classified as lonely (43% to 48%) Social isolation scores and % classified as isolated declined (51% to 39%) Increases in loneliness but not in social isolation were associated with depression
Mistry et al. (2021) Bangladesh	Cross-sectional	1,032 older adults (≥ 60)	<ul style="list-style-type: none"> Single questions: Loneliness, Isolation Social isolation also measured based on living arrangements and communication with others 	<ul style="list-style-type: none"> 43% lonely 38% isolated Loneliness and social isolation were associated with higher levels of depression
Wong et al. (2020) Hong Kong	Longitudinal (Pre- and peri-pandemic)	583 older adults (≥ 60) with at least two chronic conditions	De Jong Gierveld Loneliness Scale	<ul style="list-style-type: none"> Higher levels of overall, social, and emotional loneliness during the pandemic than at baseline 70% moderate or severe loneliness Living alone, being female, and having ≥ 4 chronic conditions were associated with higher levels of loneliness
Strutt et al. (2021) Australia	Cross-sectional	201 older adults (≥ 60)	<ul style="list-style-type: none"> De Jong Gierveld Loneliness Scale Lubben Social Network Scale 	<ul style="list-style-type: none"> 20% limited social network 66% moderate or higher loneliness Living alone and lack of contact with grandchildren were associated with higher levels of loneliness Loneliness predicted depression, psychological distress, and lower quality of life scores, but not anxiety Higher social network scores were a protective factor for loneliness
Kim & Jung (2020) Pooled analysis of 62 countries	Cross-sectional	13,660 older adults	Measured social isolation using a 3-item social distancing question	Social distancing was associated with COVID-19 related psychological distress

reduced the observed patterns of loneliness. Further research is required to determine the causes of the observed declines or levelling of loneliness.

A smaller number of studies reported on levels of social isolation during the pandemic. In the longitudinal study by Kotwal et al. (2021) levels of social isolation ranged from 33 to 49 per cent during the pandemic and were highest during the first periods of data collection. Herrera et al. (2021) in Chile found that social isolation scores had decreased during the pandemic compared with pre-pandemic. In a cross-sectional survey, Gaeta and Brydges (2020) reported that 56 per cent of older adults felt isolated; however, this report was based on the subjective perceptions of social isolation among older adults rather than an objective measure, such as levels of contact or network size. In an Australian study, Strutt et al. (2021) reported that 20 per cent of older adults had a limited social network during the pandemic. Additionally, other studies reported that between 43 and 69 per cent of older adults were engaging in self-isolation or strict social distancing (Brown et al., 2021; Emerson, 2020; Kobayashi et al., 2021; Lehtisalo et al., 2021; Röhr et al., 2020).

Factors Associated with Social Isolation and Loneliness during the Pandemic

Twenty-four studies reported on factors associated with loneliness or social isolation during the pandemic (almost all focused on associations with loneliness, and only a few examined social isolation) (see Table 2). Furthermore, most of the factors identified were risk factors ("risk" means an increase in the likelihood of experiencing loneliness and social isolation based on a particular factor), rather than protective factors. Our findings are organized in the following sections based on the domains of SE model; studies primarily focused on the individual level, with some attention also paid to interpersonal and policy level factors.

At the individual level, key factors that were reported in articles included age, gender (binary), subjective perceptions of aging, and health conditions. In the studies reviewed, associations with age and gender were equivocal. Gender (being female) was associated with higher rates of loneliness in some studies (Choi et al., 2021; Röhr et al., 2020; Whatley, Siegel, Schwartz, Silaj, & Castel, 2020; Wong et al., 2020), but not in others (e.g., Cihan & Gökgöz Durmaz, 2021; Parlapani et al., 2020; Polenick et al., 2021). When comparing segments of the older adult population, some studies found that more advanced age was associated with greater loneliness (Cihan & Gökgöz Durmaz, 2021; Lehtisalo et al., 2021), whereas other studies reported the opposite pattern (Choi et al., 2021; Kobayashi et al., 2021). Other studies reported higher levels of social isolation (Birditt et al., 2021), but not loneliness among older adults compared to younger age groups (Losada-Baltar, Jiménez-Gonzalo, et al., 2021, Luchetti et al., 2020; Minahan, Falzarano, Yazdani, & Siedlecki, 2021). In a comparison of older and younger age groups Luchetti et al. (2020) found that only older adults experienced a statistically significant increase in levels of loneliness during the pandemic. Older subjective age (Schorr et al., 2021b; Shrira et al., 2020) and negative perceptions about aging (Losada-Baltar, Jiménez-Gonzalo, et al., 2021; Whatley et al., 2020) were identified as risk factors associated with loneliness. Additionally, multiple chronic conditions and poor health were risk factors for loneliness (Whatley et al., 2020; Wong et al., 2020). Protective factors identified at the individual level included: being a person of color (Choi et al., 2021; Polenick et al., 2021) and individual

resilience, based on perceived ability to cope with stress (Röhr et al., 2020).

Loneliness was also associated with several individual risk factors that related specifically to the unique circumstances of the COVID-19 pandemic and extended across micro, meso, and macro domains of the SE model. These included: experiencing personal losses (Van Tilburg et al., 2020), financial strain (Polenick et al., 2021), COVID-19 anxiety or worries (Gaeta & Brydges, 2020; Kivi et al., 2021; Polenick et al., 2021; Van Tilburg et al., 2020), intolerance of uncertainty (Parlapani et al., 2020), being a relative of a healthcare worker (Cihan & Gökgöz Durmaz, 2021), and having a family member infected with COVID-19 (Cihan & Gökgöz Durmaz, 2021).

Living alone was consistently identified as an interpersonal level risk factor associated with higher rates of loneliness during the pandemic (Choi et al., 2021; Cihan & Gökgöz Durmaz, 2021; Emerson, 2020; Fingerman et al., 2021; Lehtisalo et al., 2021; Parlapani et al., 2020; Stolz et al., 2021; Strutt et al., 2021; Wong et al., 2020). However, a study by Heidinger and Richter (2020) reported a heightening in reported loneliness during the pandemic among older individuals living with others but not in those living alone. Living alone also was associated with not having in-person contact with others during the pandemic (Fingerman et al., 2021). Identified interpersonal protective factors included: social support (Polenick et al., 2021), living with others (Polenick et al., 2021; Van Tilburg et al., 2020), stronger social networks (Strutt et al., 2021), more social interactions (Macdonald & Hülür, 2021), and satisfaction with communication (Macdonald & Hülür, 2021).

At the policy level, several studies investigated the relationship between pandemic restrictions and loneliness. Choi et al. (2021) found the following aspects of social distancing are associated with loneliness: cancelling/postponing social activities and avoiding close contact with people in the household. In a study by Stolz et al. (2021) older adults were asked whether they had been negatively affected by seven types of pandemic restrictions; reporting more negative exposures to pandemic restrictions was associated with higher levels of loneliness. Self-isolating and reduced social interactions were also associated with loneliness (Röhr et al., 2020; Strutt et al., 2021; van Tilburg et al., 2020), but few studies focused exclusively on social isolation.

The risk factors associated with loneliness during the pandemic underscore the relevance of the SE domains of influence (particularly at the individual and interpersonal levels). The combination of risk (e.g., living alone) and protective factors (e.g., social support, satisfaction with communication) indicate that interpersonal factors, in particular, likely play a role in fostering resilience to loneliness. The research also suggests that targeted interventions are needed to enhance the resilience and adaptability of older adult populations who are vulnerable to loneliness (e.g., older adults living alone, older adults experiencing multi-morbidity).

Effects of Social Isolation and Loneliness on Older Adults during the Pandemic

Fourteen studies reported on potential negative effects of social isolation and loneliness on older adults during the pandemic (see Table 2). It is important to acknowledge that most of the studies included in this section are cross-sectional ($n = 11$); therefore, the directionality of associations cannot be conclusively determined.

Multiple studies reported that perceived loneliness during the pandemic was associated with depression (Herrera et al., 2021;

Kotwal et al., 2021; Krendl & Perry, 2021; Mistry et al., 2021; Robb et al., 2020; Schorr et al., 2021a; Shrira et al., 2020; Strutt et al., 2021) and anxiety (Kılınçel et al., 2020; Kotwal et al., 2021; Robb et al., 2020; Shrira et al., 2020). However, one Spanish study reported no associations with anxiety and depression; the null finding may have been related to their choice of measurement of loneliness (living alone rather than a validated scale or a loneliness-specific question) (García-Fernandez, Romero-Ferreiro, López-Roldán, Padilla, & Rodríguez-Jimenez, 2020). Studies also found that loneliness was associated with sleep problems (Grossman, Hoffman, Palgi, & Shrira, 2021), poor quality of life (Strutt et al., 2021), peritraumatic stress (Shrira et al., 2020), and psychological distress (Strutt et al., 2021).

On the other hand, studies focusing on the effects of social isolation on depression and anxiety during the pandemic have been equivocal. Several studies showed no effects of social isolation on these psycho-social outcomes (Herrera et al., 2021; Kotwal et al., 2021; Minahan et al., 2021). In contrast, a Bangladeshi study identified social isolation as being positively associated with depression (Mistry et al., 2021). In addition, in an analysis of data from 62 countries, Kim and Jung (2021) found that social distancing was associated with COVID-19 related psychological distress. Furthermore, a qualitative study conducted with older adults with cognitive impairments who lived alone found that participants were experiencing significant psychological distress as a result of pandemic isolation (Portacolone et al., 2021).

Whitehead and Torossian (2021) asked older adults to identify sources of stress in their lives during the pandemic, and loneliness/isolation was the third most frequently identified stressor. Comparison of the responses of different demographic groups revealed that older women, low-income older adults, and single/widowed older adults ranked loneliness/isolation as their number one stressor.

Strategies to Reduce Social Isolation and Loneliness during the Pandemic

The complex systems resilience framework identifies the need to respond to pandemic adversity and foster strengths to build resilience. Twenty articles were identified discussing strategies for reducing social isolation and/or loneliness during the pandemic among older adult populations. (See the next section for examples of interventions). Most articles focused on strategies at the individual and interpersonal levels, rather than opportunities for intervening at higher system levels (e.g., changes to policy, community-level approaches). Only two articles specifically focused on strategies to address social isolation (Dassieu & Sourial, 2021; Sixsmith, 2020) and three specifically focused on strategies to address on loneliness (Burke, 2020; Conroy, Krishnan, Mittelstaedt, & Patel, 2020; Dahlberg, 2021), while the remaining articles discussed strategies to address social isolation, loneliness, and related concepts in conjunction. Because of the significant overlap in the literature, most of the strategies will be described as potentially having applicability for addressing both social isolation and loneliness, although distinctions are made as appropriate.

Technology was frequently discussed in the literature as an essential component for innovative approaches to address social isolation and loneliness and was the core focus of half of the articles reviewed ($n = 10$). In the literature, technology-focused strategies for addressing social isolation and loneliness were described in multiple domains of the SE model. At the individual level, technology was positioned as a means to build the resilience of older

adults by increasing their access to social support, information, and resources during the pandemic. Education and training for older adults on the use of digital technology was emphasized as necessary for technology-based interventions to be successful at reducing social isolation and loneliness (Conroy et al., 2020; Daly et al., 2021; Day, Gould, & Hazelby, 2020; Seifert, Cotten, & Xie, 2021). Peer or intergenerational training programs were suggested as ways to teach older adults how to use digital technologies (Daly et al., 2021; Xie et al., 2020). At the interpersonal level, Smith et al. (2020) contend that older adults need to use technology to engage in “distanced connectivity” during the pandemic. A narrative review by Gorenko, Moran, Flynn, Dobson, and Konnert (2021) identified the following types of remotely delivered interventions as being efficacious and feasible for use during the pandemic: telephone befriending (i.e., older adults are matched with volunteers for regular phone calls), the Senior Centre Without Walls (SCWW) model (i.e., social and educational programs provided virtually or by telephone), and programs that provide training to older adults on how to use the Internet and social media. It has also been recommended that digital technology be used to facilitate social visits, group activities, and health promotion interventions during the pandemic (Conroy et al., 2020; Daly et al., 2021; Sepúlveda-Loyola et al., 2020; Smith et al., 2020; Xie et al., 2020). Hajek and König (2020) reviewed the small number of studies evaluating the effectiveness of social media use for reducing social isolation or loneliness among older adults; two studies observed no impacts, while one found lower social isolation scores.

Authors also discussed the “digital divide”, a meso level challenge that connects the individual and organizational/policy domains of the SE model. The term “digital divide” is used to highlight the challenge that not all older adults have access to or use the Internet and digital technologies, and certain groups are in danger of being further excluded from society because of the increasing reliance on digital technologies during the pandemic (e.g., low-income older adults, people living in rural areas, the oldest age groups, older adults with functional impairments or multi-morbidity) (Conroy et al., 2020; Seifert et al., 2021; Sixsmith, 2020; Smith et al., 2020). Recommended steps to address the challenges posed by the digital divide included: (1) offering some low-tech interventions such as telephone and mail interventions (Conroy et al., 2020; Seifert et al., 2021; Smith et al., 2020), (2) ensuring access to low-cost, high-speed Internet for all older adults (Seifert et al., 2021), and (3) developing technologies that are accessible to older adults with low technology literacy levels and functional impairments (Seifert et al., 2021).

In addition to technology-based strategies, a range of additional approaches were discussed in the literature to address social isolation and loneliness. Recommended strategies to build upon the strengths and resilience of individuals included: encouraging participation in more outdoor activities (Dahlberg, 2021; Day et al., 2020; Hwang, Rabheru, Peisah, Reichman, & Ikeda, 2020), culturally and religiously grounded interventions (Giwa, Mullings, & Karki, 2020), and creative arts (Day et al., 2020). Psychological interventions (e.g., one-on-one interventions, cognitive behavioural therapy, meditation, life review therapy) were also recommended specifically to address loneliness (Conroy et al., 2020; Gorenko et al., 2021; Van Orden et al., 2020).

In the literature, interpersonal level strategies for addressing social isolation and loneliness focused on providing opportunities for human and non-human companionship. Burke (2020) observed that the pandemic has reduced opportunities for natural intergenerational interactions. Programs that foster intergenerational

connections were identified as important components of COVID-19 responses (Burke, 2020; Day et al., 2020; Xie et al., 2020). Sepúlveda-Loyola et al. (2020) have also emphasized the importance of staying connected with family. Social robots and pets have been proposed as forms of non-human companionship to reduce both social isolation and loneliness among older adult populations (though some might question the impact they would have on social isolation and whether one can have social interactions and relationships with a non-human companion). Although currently robots are not advanced enough to act as close friends, they can be used for entertainment and companionship purposes which may be beneficial given the lack of options for in-person contact during the pandemic (Henkel, Čaić, Blaurock, & Okan, 2020; Jecker, 2020). Pets were also highlighted as an important form of non-human companionship by Rauktis and Hoy-Gerlach (2020), who suggest that steps may need to be taken to support older pet owners during the pandemic (e.g., assistance with shopping for pet food). Media reports show that pet adoption increased significantly during the pandemic (e.g., Cotnam, 2020), which may be a result of Canadians seeking to address social needs through non-human companionship.

At the organizational system level, it has been observed that given the unique circumstances of the pandemic traditional approaches for prevention and identifying people who are socially isolated or lonely may need to be altered (Dassieu & Sourial, 2021; Smith et al., 2020). For health care organizations, health care professionals were identified as having a role to play in addressing social isolation and loneliness through home visits for assessment and prevention initiatives (Day et al., 2020), the development of social connection plans with older adults (Van Orden et al., 2020), and online group health interventions (Day et al., 2020). Providing volunteering opportunities to older adults may also reduce social isolation and loneliness, while also magnifying the capacity of organizations (Wu, 2020; Xie et al., 2020). Indeed, volunteering became a fulcrum for the successful implementation of many programs that needed to pivot during the pandemic.

Interventions Implemented to Reduce Social Isolation and Loneliness during the Pandemic

A small number of articles ($n = 9$) described the development and/or evaluation of interventions that had been implemented during the pandemic to reduce social isolation and loneliness among older adults. Interventions were deemed to be targeting social isolation and loneliness based on consideration of their target populations, descriptions of the programs and program theories, and pre-existing knowledge of interventions to reduce social isolation and loneliness. Six of the studies described interventions implemented in the United States, two described interventions implemented in Israel, and one described interventions implemented in Canada (discussed subsequently in this article). Whereas the articles on Zoom-based group interventions linked the interventions primarily to the aim of reducing loneliness, the articles on befriending programs and telephone outreach suggest applicability for reducing social isolation and/or loneliness. The interventions primarily targeted individual and interpersonal domains of the SE model.

Four of the articles described befriending programs that matched volunteers (most often university students) with isolated/lonely older adults for regular telephone or virtual calls (Dikaos et al., 2020; Joosten-Hagye, Katz, Sivers-Teixeira, & Yonshiro-Cho, 2020; Lewis & Strano-Paul, 2021; Office, Rodenstein, Merchant,

Pendergrast, & Lindquist, 2020). The articles suggested that the connections formed through befriending programs can reduce social isolation and/or loneliness or mitigate their negative effects. However, none of the studies directly measured or planned to measure whether the interventions affected levels of social isolation or loneliness. A pre-post test evaluation (Joosten-Hagye et al., 2020) and anecdotal evidence from the volunteers (Office et al., 2020; Lewis & Strano-Paul, 2021) suggest that the calls resulted in positive connections between the volunteers and older adults.

Two articles described telephone outreach programs in which staff or volunteers conduct check-ins with isolated older adults. One article was a process evaluation of a virtual training program for older adult volunteers in a telephone outreach program (Lee, Fields, Cassidy, & Feinhals, 2021), while the other article reported on a telephone outreach program established by the Health Black Elders Centre for their members (Rorai & Perry, 2020). Anecdotally it was reported that older adults viewed the calls positively and some were able to be referred/connected to needed services.

Three articles described Zoom-based group interventions that aimed to serve as a substitute for in-person group activities and provide opportunities for social interaction. Shapira et al. (2021) conducted a pilot randomized controlled trial of a seven-session cognitive behavioural therapy Zoom group ($n = 64$ intervention group, $n = 18$ comparison group). The intervention group had a statistically significant decrease in loneliness scores post-intervention compared with the comparison group, although further studies are needed. Cohen-Mansfield, Muff, Meschiany, and Lev-Ari (2021) surveyed participants and non-participants in Zoom activities offered by a health rehabilitation company. They found that only 16 per cent of participants specifically participated to relieve loneliness; however, 42 per cent thought that social contact should be a core component of activities. Physical activity, relief from boredom, and loneliness and social interaction needs were the central factors motivating participation in the programs. An article by Zubatsky (2021) describes three group health promotion programs that have proven effective in in-person settings and were transitioned to virtual delivery during the pandemic: A Matter of Balance, Cognitive Stimulation Therapy, and Circle of Friends. The article does not include any evaluation of the virtual versions of these programs, but presumably programs that have proven effective in person could be effective in virtual settings provided they were appropriately retrofitted. Further research to confirm the effectiveness of these programs in virtual settings would be beneficial.

Although only one Canadian academic article was found, a supplementary scan of the Canadian grey literature identified seven common types of programs that were being implemented/ utilized to reduce social isolation and loneliness among the older adult population during the pandemic: befriending programs, telephone help and information lines, telephone outreach, practical assistance, Senior Centre Without Walls, remote health promotion and wellness programs, and technology access and training programs. Table 3 describes the type of program, anecdotal evidence on benefits or demand for the program during the pandemic, and a selection of Canadian program examples. Many programs identified were being delivered by non-profit and voluntary organizations (e.g., see Hannah, 2020; Campbell, 2020; A & O, n.d.), but programs were also delivered by other groups such as health care organizations (e.g., Sault Area Hospital, n.d.) and student groups (e.g., Parsons, 2020). Volunteers usually played a role in befriending, practical assistance,

Table 3. Canadian examples of programs to reduce social isolation and loneliness among older adults

Description of Program Type	Examples of Anecdotal Evidence	Canadian Examples
Befriending programs: Volunteers are matched with isolated older adults and engage in regular in-person or remote (virtual or over the telephone) visits.	Anecdotally, it has been reported that these programs have formed positive connections between older adults and volunteers. High demand has led to the expansion or extension of befriending programs in many communities during the pandemic (Campbell, 2020; Lyall, 2021; Parsons, 2020).	<ul style="list-style-type: none"> • Student-Senior Isolation Prevention Partnership (Parsons, 2020) • Art of Conversation (Malbeuf, 2021) • Keep in Touch (Campbell, 2020) • Community Connects (Lyall, 2021)
Telephone help and information lines: Older adults can call the line and receive emotional support and have a friendly chat with the operator. Older adults also can be provided with referrals or information on services, including those that can alleviate social isolation or loneliness.	Anecdotal evidence suggests that there are rising call volumes to these lines during the pandemic (Ireland, 2020; Szperling, 2020; United Way Centraide Canada, 2020).	<ul style="list-style-type: none"> • A Friendly Voice (Szperling, 2020) • Toronto Seniors Helpline (Ireland, 2020) • 211 Programs (United Way Centraide Canada, 2020)
Telephone outreach: Telephone outreach programs usually target vulnerable and isolated older adults. Staff or volunteers call older adults to offer check-ins, emotional support, and referral to needed services.	Anecdotally, telephone outreach programs have been described as providing socialization opportunities for older adults, as well as identifying opportunities to address unmet social needs (Sault Area Hospital, n.d.; Volunteer Toronto, 2020)	<ul style="list-style-type: none"> • Algoma Seniors Telephone Outreach Program (Sault Area Hospital, n.d.) • Maintaining Community Connections (Volunteer Toronto, 2020)
Practical assistance: Practical assistance programs have been developed to offer older adults services such as meal delivery, grocery delivery, transportation, and wellness check-ins. Practical assistance programs involve small social interactions with staff or volunteers and show care towards older adults. Outreach and friendly conversation are often informal components of these programs.	There has been a high demand for practical assistance services during the pandemic (Hannah, 2020). Anecdotally, it has been reported that friendly conversations and check-ins are a core component of meal/food delivery approaches, and providers believe that these efforts help to alleviate loneliness (Healthy Aging CORE British Columbia, 2020b; Silberman, 2020).	<ul style="list-style-type: none"> • Safe Seniors, Strong Communities (Hannah, 2020) • Seniors Social Supports (Calgary Seniors' Resource Society, n.d.) • Seniors Lunch Program (Healthy Aging CORE British Columbia, 2020c) • Breakfast Delivery Program (Mortimer, 2021)
Senior Centres Without Walls (SCWW): SCWW offer a wide array of social and educational programs to older adults virtually or by telephone. (Many similar style remote programs are also being offered by organizations but not under the official SCWW label).	Anecdotally it has been reported by providers that many participants were very isolated prior to participation (Healthy Aging CORE British Columbia, 2020a) and demand has led to expansions in the number and frequency of sessions offered (Edmonton Southside Primary Care Network, 2021; Zillich, 2020).	<ul style="list-style-type: none"> • Edmonton Southside Primary Care Network SCWW (Edmonton Southside Primary Care Network, 2021) • A & O SCWW (A & O, n.d.) • Seniors Outreach and Resource Centre SCWW (Healthy Aging CORE British Columbia, 2020b) • Surrey SCWW (Zillich, 2020)
Remote health promotion and wellness programs: Health promotion and wellness programs such as caregiver support groups, physical activity programs, and adult day programs have transitioned to remote delivery during the pandemic. Facilitating connections between participants is usually an objective of the programs.	Many of these new remote health promotion programs are based on pre-pandemic in-person/remote interventions that had evidence suggesting their effectiveness at reducing social isolation or loneliness.	<ul style="list-style-type: none"> • Online Caregiver Support Groups (Ontario Caregiver Organization, n.d.) • Well Connected (Healthy Aging CORE Alberta, 2020) • Choose to Move (Choose to Move, 2021)
Technology access and training programs: Because of pandemic restrictions, many Canadians have turned to digital technology to connect with others. However, older adults may not have the knowledge or income required to use digital technologies. Technology training programs train and educate older adults on how to use digital technology. Some also include access components and loan/gift digital technology and internet access to older adults.	Anecdotal evidence from service providers and older adults suggests that these programs are successful at facilitating access to digital technology, and older adults use the digital technology for activities such as video calls with family and participating in group activities (Palamarchuk, 2020)	<ul style="list-style-type: none"> • Tech Savvy Empowered Older Women (Palamarchuk, 2020) • Digital Learning Pilot Programs: ITECH Packages (Healthy Aging CORE British Columbia, 2020a)

telephone outreach, and telephone line programs. The review of the grey literature also reveals the strong reliance on both low-tech (e.g., telephone) and high-tech (e.g., Zoom) interventions. Anecdotally, evidence suggests high demand for most of these programs during the pandemic as well as perceptions by service providers or older adults of positive impacts (see Table 3), although further research is required to determine whether they are reducing social isolation and loneliness. As will be described in the Discussion, pre-pandemic literature provides evidence of the effectiveness of some of these programs at reducing loneliness or social isolation.

Discussion

Data from the CLSA have revealed significant increases in levels of loneliness among Canadian older adults during the pandemic compared with pre-pandemic times. These findings are in line with the findings from international longitudinal studies (e.g., Krendl & Perry, 2021; Macdonald & Hülür, 2021; Van Tilburg et al., 2020; Wong et al., 2020), although the levels of increase in loneliness vary considerably. Two notable outliers were Chile (mixed results) and Sweden (no significant differences in levels of loneliness). The findings from Sweden are likely a result of the unique “herd

immunity” approach Sweden has adopted during the pandemic, and the lack of measures in place limiting socialization and gatherings (Claeson & Hanson, 2021). The reasons for the mixed results in Chile are less clear given that COVID-19 restrictions have been in place; the authors suggest that high rates of smartphone use and close contact with family members may have influenced these results (Herrera et al., 2021).

Longitudinal studies conducted peri-pandemic generally suggested that loneliness levels have been relatively stable during the pandemic, often with a spike during the initial implementation of lock-down/stay-at-home orders, followed by a levelling off. This is possibly indicative of processes of resilience among older adults, in which past experiences of adversity, greater access to support systems, and/or changing perceptions of social connections enhanced their ability to cope with pandemic mitigation policies and other pandemic-related constraints. For example, Igarashi et al. (2021) found that 93 per cent of their sample of older adults described experiencing vulnerabilities directly linked to the pandemic; yet, approximately two thirds identified positive responses to these adversities. Moreover, despite reporting pandemic-related isolation and challenges maintaining interpersonal relationships, older adults described the deepening of pre-existing relationships and increased appreciation for these relationships.

Living alone emerged as the most consistent risk factor associated with loneliness in the pandemic literature. This is unsurprising given that COVID-19 restrictions in many jurisdictions prohibit/limit social interactions with people from outside of the household. A review of pre-pandemic literature also found living alone was associated with loneliness (Cohen-Mansfield et al., 2016). Given the paucity of research in the pandemic literature that examined other vulnerabilities underlying social isolation and loneliness, we can only speculate that there are likely a myriad additional risk factors at the micro, meso, and macro levels of influence based on well-established pre-pandemic research in this field.

Strong associations emerged between loneliness and depression in the pandemic literature. On the other hand, most studies did not find a relationship between social isolation and depression. Pre-pandemic literature has frequently reported associations between loneliness and depression and between social isolation and depression (Donovan & Blazer, 2020). However, results for social isolation have varied depending on the measurements used. Schwarzbach Luppá, Forstmeier, König, and Riedel-Heller (2014) found the strongest evidence of an association for the following types of measures of social isolation: social support, quality of relations, and presence of confidantes.

A limitation of the current research on patterns of social isolation and loneliness is that most studies identified only reported on social isolation and loneliness patterns during the early stages of the pandemic (i.e., March to June 2020), when COVID-19 was newly emerging and lockdown measures were particularly stringent. Additionally, studies tended to focus on patterns of loneliness and only a small number reported on patterns of social isolation. In addition, different measures of social isolation and loneliness were utilized ranging from validated scales to single-item proxies or questions on pandemic experiences. Differences in populations and pandemic restrictions and progression in jurisdictions make comparisons tenuous. Further research is required to understand how levels of social isolation and loneliness have been impacted over the long term and whether higher levels of loneliness will persist as the pandemic continues to change over time.

The literature has strongly emphasized “pandemic age-friendly” approaches to reducing social isolation and loneliness that rely on

digital technology. Although digital technology is an essential component of the lives of most Canadians, pre-pandemic data suggest that one third of older Canadians do not use the Internet (Davidson & Schimmele, 2019). Rates of Internet use are particularly low for the 80 and up age group, with only two in five using the Internet (Davidson & Schimmele, 2019). To overcome this digital divide, efforts are needed to ensure that all communities have broad-band WiFi, and that all Canadians have access to low-cost high-speed Internet in their homes, as well as digital technology training and education if needed. An additional caveat that has been provided in the literature about digital technologies and other technological forms of companionship (e.g., robots) is that they can not fully replace the need for in-person contact (Dahlberg, 2021; Henkel et al., 2020; Jecker, 2020; Sixsmith, 2020). Dahlberg (2021) also observes that in the literature there has been less focus on non-technological options such as outdoor activities and promoting neighbourliness and community.

To date, few of the interventions implemented/utilized to reduce social isolation and loneliness among older adult populations during the pandemic have been the subject of formal evaluations. Pre-pandemic literature provides evidence supporting the effectiveness of some of the identified interventions. The most robust body of evidence has been connected to digital technology interventions. Reviews of the impacts of digital technology use on older adults suggest it has positive impacts on aspects of social isolation (e.g., increasing contact with family, intergenerational relationships). However, evidence specifically on the effects of digital technology interventions on loneliness has been equivocal (Chen & Schulz, 2016; Damant, Knapp, Freddolino, & Lombard, 2017; Ibarra, Baez, Cernuzzi, & Casati, 2020). Furthermore, there is a paucity of literature evaluating other types of interventions. Evaluations of virtual programs for older adults conducted prior to the pandemic suggest that they can reduce social isolation (Botner, 2018; Gorenko et al., 2021). Some pre-pandemic evidence also exists on the effectiveness of Senior Centre Without Walls programs (Newall & Menec, 2015), telephone helplines (Preston & Moore, 2019), and practical assistance programs (i.e., meal and grocery delivery) (Thomas, Akobundu, & Dosa, 2016; Wright, Vance, Sudduth, & Epps, 2015) at reducing social isolation and/or loneliness among older adult populations. One can speculate that programs with evidence of efficacy and effectiveness pre-pandemic would also be supported during the pandemic, if they have been retrofitted to address the inherent context and constraints of the pandemic environment.

Our examination of the patterns, risks, and responses to social isolation and loneliness among older individuals reveals complex systems of vulnerability and resilience occurring within the spheres of influence identified in the SE model (Bronfenbrenner, 1994; Stokols, 1992; 2017). The SE model affords investigation into the larger policy framework that can both create social isolation and loneliness resulting from pandemic mitigation, while also offering insight into opportunities for intervention at different levels of the SE framework. It also points to the need to consider meso-level inequalities such as the digital divide, and the micro-level adjustments that individuals make in response to the pandemic. Although the literature explored micro-level (e.g., need for digital technology training), meso-level (e.g., digital divide), and macro-level (e.g., policy on high-speed Internet access) considerations for digital technology interventions, other potential interventions have not been afforded the same multi-level analysis. Future research should engage in multi-level analysis of strategies to reduce social isolation and loneliness among older

adult populations, as well as identifying potential disparities in access to interventions (e.g., digital technology) for marginalized groups.

Furthermore, the use of a resilience conceptualization elucidates how some individuals and groups adapt and respond positively to the adversities of the pandemic better than others (Klasa, Galaitsi, Trump, & Linkov, 2021; Klasa, Galaitsi, Wister, & Linkov, 2021; Wister & Speechley, 2020). For example, initial research suggests that older persons who exhibited proactive coping during the early waves of the pandemic were able to reduce the level of pandemic stress and improve psychological well-being (Pearman et al., 2021; Whitehead, 2021). Although this work is in its infancy, a strength-based approach suggests that by identifying positive adaptations and responses to pandemic adversities, older individuals can leverage pre-existing strengths and innovative interventions can be developed that reinforce and enhance resilience. In this review, the findings on protective factors for social isolation and loneliness were limited, with the exception of several interpersonal protective elements (e.g., satisfaction with communication, social support). Further research would benefit from a greater focus on the strengths and resilience of older adults in the face of adverse circumstances (Wister et al., 2022).

Several limitations of this review should be noted. First, because of the recency of the pandemic and the lag between interventions being implemented and publication of evaluation results, this review may not capture the full picture of interventions and strategies being used to reduce social isolation and loneliness among older adult populations during the pandemic. The grey literature scan that was conducted attempted to address this deficit. Second, almost all of the academic literature identified were from countries other than Canada. As was illustrated with the example of Sweden, pandemic restrictions and mitigation strategies vary by jurisdiction. As a result, caution should be used when generalizing COVID-19 research from other jurisdictions to Canada. Third, the study designs, measures of social isolation and loneliness used, and populations or sub-populations under study varied and may explain some of the inconsistencies in findings.

Conclusion

Analysis of data from the CLSA, the largest representative longitudinal study of aging in Canada, has revealed striking increases in levels of loneliness among older Canadians. Review of international literature suggests that many other jurisdictions are experiencing significant increases in loneliness among older adult populations during the COVID-19 pandemic as well. To date, literature has primarily discussed and emphasized the use of technology-based interventions to reduce social isolation and loneliness. However, as has been noted in the literature, a “digital divide” exists and not all older adults have access to digital technology or use the Internet. Low-tech solutions, including using telephones and volunteers to meet basic needs during lock-down phases of the pandemic, also show promise. Researchers should focus on exploring the wider array of pandemic age-friendly interventions (e.g., outdoor activities, intergenerational programs, and other outreach approaches) that may be useful for reducing social isolation and loneliness among older adult populations. Furthermore, this review has exposed the lack of evaluation of interventions to reduce social isolation and loneliness even pre-pandemic, and therefore, a greater focus on evaluating such interventions is needed moving forward. Advancement of knowledge of the risk, response, and

resilience embedded in the current pandemic will help us to understand the larger processes underlying these issues and to prepare for future forms of adversity facing societies.

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