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On the triple exclusion of older adults during COVID-19: Technology, digital literacy and social isolation

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ABSTRACT

During the COVID-19 pandemic, the relationship between older adults and digital technology became complicated. Prior to the pandemic, some older adults may have faced a double exclusion due to a lack of digital literacy and social interaction, and the pandemic-imposed transition to nearly all aspects of life being online magnified the requirement for people to be increasingly digitally literate. This paper presents an exploratory analysis to understand how the increased online nature of the world during the pandemic may have impacted older adults' relationship with digital technology by expanding on a prior study of older adults who, pre-pandemic, self-identified as occasional or non-users of digital technology. Follow-up interviews were conducted with 12 of these people during the pandemic. Our findings demonstrate the ways that their risk of precarity became heightened and how they began to use digital technology more frequently, strengthening and applying their digital literacy skills to remain virtually connected with friends and family. Further, the paper advances the concept of a triple exclusion for older adults who are non-users of digital technology and describes how digital literacy and remaining virtually connected can work in tandem, helping older adults to remain included in society.

1. Introduction

Digital technology, including but not limited to the internet, computers, smartphones, social media and video streaming services, is an important component of modern life (Hilbert, 2020). Different groups of people have used digital technology in different formats, methods and frequencies. Older adults, for example, represent a range of digital technology user typologies conceptualized by Quan-Haase et al. (2018), accounting for those who use digital technologies in their everyday lives, those who have a modest relationship with digital technologies and those who are non-users. These user typologies are evident within the Canadian context, with 61.7% of individuals over age 65 describing themselves as daily internet users, and 31.8% identifying as non-users (those who have not used the internet in the past month) (Davidson & Schimmele, 2019). Older adults who find themselves in the modest to non-user typology tend to have a precarious relationship with digital technology, infrequently engaging with it (Niehaves & Plattfaut, 2014) and using fewer types of digital technologies than younger people (Olsen et al., 2011).

As older adults in this modest to non-users of technology group may feel uncomfortable with the growing digitization of society, they may too experience digital exclusion from tech-savvy people of all ages, including their digitally-competent same-age peers, but especially from young people who are largely tech-savvy (Betts et al., 2019). This digital divide can be attributed to unequal technological access between populations, and because older people often require more technological knowledge and resources to engage adequately with technology (Haggittai et al., 2019). This divide increases the risk of precarity in later life (Grenier et al., 2020) where there is an increased uncertainty, insecurity, vulnerability and risk among older adults (Colibaba, Skinner, & McCrillis, 2021). With respect to older adults and the digital divide, the unequal access to technology may create a sense of uncertainty and vulnerability in relation to accessing services (e.g., telemedicine) (Frydman et al., 2022). For older adults, barriers such as lack of technological skills and limited desire to learn new skills can intensify the divide, especially when opportunities such as using digital technology for means of social interaction can help to reduce the generational divide (Betts et al., 2019). What is missing from the literature, however, is an

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exploration of how older adults who are modest to non-users of digital technology fared in terms of skills, connection, and interaction during large-scale global crises, such as the COVID-19 pandemic, when society saw a large shift towards an increasing online environment.

1.1. Challenges and opportunities of digital technology use in older adults

While digital technology is a fundamental component of today's society, some older adults interact with technology only in a limited fashion (Faverio, 2022). Factors such as lack of experience and knowledge, limited access (Reneland-Forsman, 2020), hesitation to try new technology (Quan-Haase et al., 2014), distrust of websites (Gatto & Tak, 2008) and cognitive/physical declines (Berkowsky et al., 2018) can influence older peoples' interaction with digital technology and can continue to fuel the divide (Carvalho et al., 2012). Community settings and physical environments can also deter people from using digital technology. For example, rural environments may exacerbate the challenges, whether through internet connectivity issues, the high cost of or access to broadband internet or limited learning opportunities (Berg et al., 2017; Ryser & Halseth, 2012; Warburton et al., 2013).

Deficits in digital literacy can negatively influence how some older people may feel about adopting digital technology (Berkowsky et al., 2018). Without the skills needed to successfully adapt to certain digital technologies, support may be required by this subgroup of older people to compensate for their lack of digital literacy. For many, their participation in digital technology can be classified as "borrowed" (Reneland-Forsman, 2020), where their adoption and participation in technology is facilitated through other people – relying on friends and family to either provide them with the skills to use it or to have them use it on their behalf.

While some older adults have faced barriers to accessing and adopting technology into their everyday lives, many others have closed the digital divide (or never experienced it) by adopting and using various forms of digital technology, along with people of other age groups. Whether for social, instrumental or informational reasons (Szabo et al., 2019), many older people do actively use digital technology and online services for reasons such as value, usability, affordability, accessibility, support, independence, experience and confidence, just like people of all ages (Lee & Coughlin, 2015). Specifically, older people are much more likely to consider adopting digital technology if they perceive that it is a positive and necessary addition to their lives (Berkowsky et al., 2018).

Digital technology can be an asset for older people – empowering groups and individuals to experience enhanced social cohesion, capacity and social participation (Warburton et al., 2013). The internet and online platforms and services, for example, have provided older adults with the convenience, connectivity and social cues that create opportunities for diverse interactions (Wellman et al., 2003), while expanding social networks and allowing them to bridge geographical distance between family and friends (Warburton et al., 2013). Digital technology can also facilitate social inclusion, personal independence and learning (Hill et al., 2015), allowing older adults to compensate for potential mobility loss and lifestyle changes that can be associated with aging and old age (McMellon & Schiffman, 2002).

1.2. Older adults, digital technology, and COVID-19

Prior to the pandemic, some older adults may have faced a double exclusion due to a lack of digital literacy and social interaction, and the pandemic-imposed transition to nearly all aspects of life being online magnified the requirement for people to be more digitally connected (Vargo et al., 2020). For those older adults who identified as non-users especially, the pandemic brought a triple jeopardy (exclusion) where they were more likely to die from contracting COVID-19, were less likely to obtain high-quality information, food, supplies or services online, and were more likely to experience isolation and loneliness (Xie et al., 2020).

While some elements of the triple exclusion (consequences of contracting the virus) are related to age, the others are entrenched within the inability of non-users to access social connections and vital goods and services in an increasingly online environment. This triple exclusion felt by many older adults during the COVID-19 pandemic expands on the digital divide (DiMaggio et al., 2001) by revealing new ways in which COVID-19 further challenged and excluded older adults from society. In addition, the COVID-19 virus itself created new challenges for this subset of the population, with contraction of the virus leading to potential harmful consequences for older individuals (Mueller et al., 2020), further amplifying the importance of utilizing online tools and resources but also further isolating, in line with the triple exclusion concept, older people who were non-users of digital technology.

For many non-users of the internet, the pandemic became a catalyst for adoption and use, connecting them with friends, family, and their communities in a time when in-person interaction was limited (Chen et al., 2021). Scholars have referred to this as a "sink or swim" moment for non-users once digital technology, such as the internet, became essential for accessing services and supports (Morrow-Howell et al., 2020). For example, Elimelech et al. (2021) found that during the pandemic, older adults noted an increased willingness to engage with digital technology if it was for social, leisure, or education activities. This increased use of technology through smartphones and tablets, for example, helped older people counter feelings of exclusion and precarity, and maintain social networks (Shan et al., 2020).

1.3. Digital technology and social isolation and exclusion

Due to physical distancing and lockdowns, the COVID-19 pandemic minimized social contact for many people, leading to feelings of social exclusion and loneliness (Berg-Weger & Morley, 2020; Murthy, 2020). These precautions taken by many countries worldwide, while working to reduce the spread of the COVID-19 virus, prevented many from meeting their physical, emotional and social needs through services and supports (Morrow-Howell et al., 2020). Older adults in particular were excluded during the pandemic, caused by not only a decrease in physical contact but a digital exclusion as well (especially salient for non-users), resulting in segregation from a society dominated by the internet and other digital technologies (Seifert et al., 2021). This exclusion, for some, led to a sense of being "left behind" as the pandemic shifted social events and service delivery to online platforms, further accentuating the digital divide (Seifert, 2020).

For those older adults who were non-users of digital technology, their likelihood of being socially excluded during times of physical distancing increased (Xie et al., 2020). As older adults are more likely to be socially isolated than younger people in general (Merchant et al., 2020), this risk became heightened when physical distancing measures required individuals to isolate themselves from anyone outside of their household. To counter feelings of isolation and loneliness during the COVID-19 pandemic, literature points to a large uptake in digital technology use among older adults (Haase et al., 2021; Shan et al., 2020; Weil et al., 2021). While some older people began using technology more regularly for the first time during the pandemic, some older adults began to use technology differently, in order to remain connected with others and to engage in meaningful activities (Haase et al., 2021). Being digitally connected no longer was an opportunity to stay current, but rather it became "fundamental to promote equality and social inclusion for the older adult population in and after the pandemic situation" (Ramos Garcia et al., 2021, p. 198).

While research points to the digitally divisive relationship between some older adults and various types of digital technology, there is a current gap in research that considers the mechanisms underlying the positive and negative outcomes associated with older peoples' digital technology use (Moore & Hancock, 2020), especially salient since the COVID-19 pandemic imposed a major shift of many activities to online. In seeking to address the gap in understanding the relationship between

older adults and digital technology during the COVID-19 pandemic, specifically those who had not adopted technology into their lives prior to the pandemic and then were faced with the reality of a suddenly very online society, this paper presents a Canadian study that examined their perspectives. The analysis highlights their experience with digital technology since the onset of the pandemic in Ontario, Canada and how building new relationships with technology helped participants push back against a triple exclusion (including a heightened risk of contracting the COVID-19 virus, less likelihood of accessing services online and an increase in social isolation and loneliness) and the resulting risk of precarity, faced by some older adults. The paper provides an overview of the study sites, methods, and analysis protocol, followed by key findings. Its conclusion advances the 'triple exclusion' concept, specifically how increased use of digital technology helped reduce exclusion and precarity during the pandemic amongst older people who had previously not adopted digital technologies into their lives.

2. Research design and methods

To study the impacts of the COVID-19 pandemic on older adults' use of digital technology, specifically those who identified as occasional or non-users of technology, an exploratory qualitative study was conducted in Ontario, between May and August 2021. The study was an exploratory expansion of a previous study that examined the experiences of older adults who self-identified as non or occasional internet users prior to the pandemic (Wells, 2020). This follow-up approach provided a unique opportunity to follow those occasional and non-users through their experience with the pandemic as society faced a rapid shift to online.

To provide some context on how the pandemic played out in Ontario during the time of the study, similar to other jurisdictions in countries like Canada, the Ontario government declared a state of emergency in March 2020, followed by the closure of all non-essential businesses and outdoor amenities, mandatory face coverings in public spaces and restrictions on social gatherings. In May 2020, parts of Ontario entered stage one of its reopening plans, with some businesses starting to open under controlled guidelines, continuing into stages two and three in July 2020. However, due to high numbers of COVID-19 cases in parts of the province, in September 2020, the Ontario government declared it was officially in the second wave of the pandemic. With COVID-19 cases rising with the introduction of variants of concern, in March 2021, Ontario entered the third wave of the pandemic (Government of Ontario, 2021). It was after this third wave in Ontario, in March 2021, that we explored the experiences and perspectives of older adults and their digital technology use and non-use during the COVID-19 pandemic.

The research was conducted in the City of Peterborough (pop. 82,094) and the town of Lakefield (pop. 17,060), which are both set within the larger geographic region of Peterborough County (pop. 138,236). Both are located approximately 100 km northeast of Toronto, Canada's largest metropolitan area. Each study site features rapidly aging populations, with Peterborough County having one in five residents over the age of 65 (Statistics Canada, 2016). Peterborough and Lakefield both offer high-speed internet services to their residents, so participants had access to the same level of internet provision.

3. Participants and recruitment

To develop the pandemic-focused research scope of the exploratory expansion study, new semi-structured interviews were conducted with participants of the initial study (Wells, 2020) after the pandemic's third wave in Ontario had ended. All participants of the pre-pandemic study were mailed a recruitment package, which included a note thanking them for their participation in the initial study, a summary of that study's findings, a letter of information introducing them to the current project and a consent form detailing what their participation in this new

study would entail (including exclusively telephone-based interviews). Drawing upon the continued rapport between the co-authors and participants, follow-up telephone calls were made to each of the participants to answer any of their questions regarding the study and, if they were interested, to set up an interview. Twelve of the 23 original participants agreed to participate in the follow-up study (52% response rate), with those not choosing to participate citing a lack of interest, discomfort discussing the pandemic, difficulty communicating over the telephone, or other health reasons that developed during the months of the pandemic, including cognitive decline, as reasons to decline participation. Table 1 provides an overview of the current study's research participants. Participants were predominately female (67%, $n = 8$), with an average age of 83 years old. Five participants resided in Lakefield and seven in Peterborough, with three living in a local retirement residence and nine living independently within the community. None were living in assisted living facilities or housing situations that required a high level of care.

4. Data collection and analysis

With ethics approval from Trent University's Research Ethics Board, exploratory semi-structured interviews were conducted with 12 older adults who previously (just before the pandemic) self-identified as non or occasional internet users. Interviews for the current study explored the impacts of the COVID-19 pandemic on how they used the internet and other digital technology. Due to lockdowns, physical distancing, and public health guidelines in place in Ontario at the time of data collection, interviews were conducted over the telephone and were approximately 30–45 min in length. Interviews with older adults considered themes of participants' use of digital technology during the COVID-19 pandemic including accessing services (e.g., how have you been able to access services and non-essential goods during lockdowns?), remaining connected to loved ones (e.g., how have you been able to remain connected to family and friends throughout the pandemic?) and if and/or how their usage changed since the onset of the pandemic (e.g., can you describe your relationship with digital technologies during the COVID-19 pandemic and how it might have changed?).

With informed consent, interviews were audio-recorded and transcribed. Following an iterative collaborative qualitative analysis (ICQA) process established by (Russell, Skinner, & Fowler, 2022), code lists were collectively developed, tested and revised by reviewing sections of transcripts. The analysis process drew upon emergent and pre-determined themes, including concerns, personal connections and digital skills, which were derived both from the literature and from the original pre-pandemic study (Wells, 2020). Using these themes as guides, the finalized code manual included five codes (disinterest, necessity, reliance on others, remaining connected and skill development). Transcripts were then coded according to the manual, where the first coder assigned code(s) to raw sections of the text, and then the second coder reviewed those pre-coded transcripts, cross-checking and refining

Table 1
Research participant demographic overview.

Participant Number	Age	Gender	Place of Residence	Type of Living Setting
1	91	Female	Lakefield	Congregate
2	83	Female	Peterborough	Independent
3	72	Female	Peterborough	Independent
4	83	Male	Lakefield	Independent
5	88	Female	Lakefield	Congregate
6	72	Female	Peterborough	Independent
7	72	Male	Peterborough	Independent
8	95	Female	Lakefield	Congregate
9	71	Female	Lakefield	Independent
10	80	Female	Peterborough	Independent
11	84	Male	Peterborough	Independent
12	100	Male	Peterborough	Independent

any inconsistencies. Code summary documents were then created, which included agglomerated text from that code, and detailed writing about the emergent key findings. Holistically analyzed for emergent, summative and largely representative key themes, these documents formed the evidence for the study findings detailed in the following Findings section. Implementing a multi-collaborator coding process strengthened the reliability of the findings, with only cross-cutting themes from the final analytic stage being included in the present findings. In our analysis, participants are cited verbatim to enhance the authenticity of our interpretation of the data. To ensure anonymity, participants are cited by a participant number and their demographic indicators (age and gender).

5. Findings

Interview findings showed that the COVID-19 pandemic impacted the ways older adults – specifically those who self-identified as occasional or non-users of the internet – used and accessed digital technologies, including digital devices and internet-based platforms. Findings show that the pandemic led older adults to 1) become more precarious through limited access to essential services given their limited use of digital technology, 2) build and improve their digital literacy skills and 3) apply those skills to remain connected with their loved ones, their community and to be entertained. While some participants did not adapt to using digital technology or relied on basic technological communications such as the telephone, some fully embraced a technology-focused lifestyle despite their previously-held identity as an occasional or non-user of digital technology. While digitally divisive challenges were apparent for older adults prior to the onset of the COVID-19 pandemic, the findings presented in this paper reflect the issues, challenges, and opportunities of participants accessing and using digital technology up to and including the third wave of the pandemic in Ontario, Canada.

5.1. Risk of increased precarity

Our findings demonstrated a mix of attitudes towards digital technology during the COVID-19 pandemic. Some participants fully embraced the switch to online, citing that the pandemic created a necessity to embrace digital technology to remain connected to the world, their community, and with family and friends, and also citing the pressure they received from children and grandchildren to connect online: “It’s the kids who influenced me. The children and the grandchildren. They kept saying ‘do this, Nana. Do that. We want to see you, Nana.’ So they’re the ones who influenced me to get online” (Participant 2, female, 83 years). Some participants remained resistant, citing their age as a factor for learning something new: “They want you to do everything online, but I’m an old bout and will resist until the bitter end” (Participant 6, male, 72 years). This resistance to change tied with older age was discussed by participants as not being a valued use of their time during the pandemic when they could continue to access some services in-person despite the risks associated with in-person contact during the pandemic. Due to other obligations, some did not have the time to learn new technology: “I just haven’t really got time to get more into other things. I’m always doing so many things and there are so many things I want to do before my time is over. I’m getting a little bit older now. I don’t know for what use it would be to learn anymore” (Participant 1, female, 91 years). These comments were made during a time in the pandemic when they could continue access some services in person, but when, prior to COVID-19 vaccinations, there were risks associated with in-person contact.

Regardless of whether a participant had become a user or was still a non-user, many were not interested in continuing to use digital technology post-pandemic, citing a general disinterest and a preference for in-person interaction: “To be honest with you, I will not be using it more after [the pandemic]. I prefer personal contact with people, like calling

them up. Basically, see them when things open back up, or call them until the lockdown is over” (Participant 3, female, age 72). Those participants who were more resistant to adopting digital technology into their everyday lives risked feeling a sense of precarity – the inability or challenge to access services – when accessing essential community and support services were pushed online to ensure the safety of all individuals. For some, their lack of knowledge, skill and confidence in digital technology challenged them in accessing specific online community services, such as booking a COVID-19 vaccination appointment. For example: “From my perspective, if it were up to me to book an online vaccine appointment, I would still be without a vaccine because I would find it too frustrating and too involved” (Participant 7, male, 72 years). For others, online banking during the pandemic was a point of contention, with some participants refusing to switch to banking online and continuing to either do their banking over a landline telephone or for one participant, accessing the service in-person: “We actually go and line up at the bank. I go once a month and line up in the rain or snow. I’m not too keen about lining up ... but it’s what I have to do to pay my bills” (Participant 4, male, 83 years).

5.2. Building digital literacy

Self-identifying as occasional or non-users of digital technology, many of the participants described not feeling confident using tablets, laptops and internet-based programs and services at the outset of the COVID-19 pandemic. This lack of confidence and ability to use digital technology caused challenges for some, making them feel unable to use devices and online services. For one participant, although she used a computer throughout her career, she still was not confident in using it on her own at home: “I never was good at the computer, although I worked with a computer at work for a long time. But I don’t feel comfortable. I don’t think I’m smart enough to be using the computer” (Participant 2, female, 83 years).

Although expressing feelings of frustration in accessing online services during the pandemic, many participants gained newfound confidence in using internet-based services and platforms, commonly expressing a “practice makes perfect” mentality. Some had begun expanding their digital literacy skills before the pandemic, taking advantage of in-person learning opportunities at spaces like the local public library. However, since the pandemic stopped many in-person services, those participants felt that their learning had been paused: “We have been slowly learning other things, although now we’ve probably forgotten all that we’ve learned because it has been so long ... We were learning how to take pictures of stuff with our camera and put them on the computer so we could try to sell them over the internet. We were slowly but surely getting that going, but the learning stopped. That part is discouraging. [The pandemic] has slowed us down. There is no doubt about it. It’s too bad” (Participant 4, male, 84 years). For many, the clubs or groups they belonged to moved to online video conferencing platforms such as Skype and Zoom, forcing the participant to learn the technology if they wished to remain involved. With practice, participants became more confident and comfortable with the platform after using it frequently, enhancing their ability to connect with clubs and community groups virtually, or hosting their own virtual sessions. One participant felt more confident using online platforms for organizing speaker sessions: “I do a monthly column for the newsletter of the local society, and our speakers have been online, so I’ve been involved in that. I’ve had to adapt to working with the online platforms and I’m more or less managing okay. I even gave a talk myself online, which was a unique experience” (Participant 7, male, 72 years).

Many participants attribute their ability to connect to the internet and use digital technology during the pandemic to the help they received from children and/or grandchildren. When asked about their experience with more frequently using digital technology, many noted that if it was not for the help of their family, they would be lost – drawing upon family for help with tasks such as software installation, connecting

to internet-based services such as online banking and creating online accounts for entertainment sites such as YouTube and Netflix: “If it has to do with the internet, I just phone my daughter and ask her to do it for me” (Participant 2, female, 83 years). Many participants, especially those with lower levels of digital literacy, relied on others for booking a COVID-19 vaccine appointment. Study participants that lived in the retirement home setting relied on the administrative staff to make the online booking on their behalf. For independent community-dwelling participants, many asked family, friends, neighbours or community services such as Community Care to set up their appointment. One participant’s husband, who was described as internet savvy, helped local seniors with their bookings: “He did it for some other seniors in the village. He set up the appointments for two or three people because they’re older than we are, in their 80s, and they didn’t know what to do” (Participant 8, female, 71 years).

5.3. Remaining socially connected

Participants described using their new digital literacy skills (whether established independently or with assistance) to remain socially connected during a time when physical interactions were limited (e.g., lockdowns and stay-at-home orders). Using internet-based communication platforms such as Zoom, Skype or Facetime allowed participants to remain connected, albeit virtually, with their close family and friends. Digital technology allowed participants to see their children, connect with friends or help their grandchildren with schoolwork, for example. For one participant, using online video conferencing platforms and sending pictures through email allowed her and her husband to meet their great-grandson for the first time: “We have a great-grandson. He is 10 months old, but I haven’t held him yet. My son-in-law sends me pictures on the phone all the time of him. It helps. It really helps. If I feel a bit down, I just pick up that phone and look at his pictures again and I’m alright. We’ve had some Zoom calls where we had all three of our daughters and their husbands, and dad and I, and we were all talking together. We had a lovely visit” (Participant 2, female, 83 years). For another participant, using her cell phone and sending photos through text message to her daughter who lived in another part of the province allowed them to remain connected through a mutual hobby of gardening: “I know how my daughter’s garden is doing because she sends me pictures and tells me what’s happening, or something will come up in the garden and she’ll ask me what plant it is. I will also show her what’s going on in my garden” (Participant 9, female, 83 years).

In addition to remaining connected with friends and family, participants noted that digital technology allowed them to remain connected to social and community groups they were active with before the pandemic, such as book clubs or for one participant, their church congregation: “I will say, the internet has really helped during the pandemic for the church service and keeping in contact with people at the church because I haven’t seen them for so long. We are always back and forth with one another, so it’s nice communication during this time” (Participant 1, female, 92 years). Exploring the use of internet-based entertainment platforms like YouTube and Netflix allowed participants to remain entertained, now online, during the pandemic. For many, reading and playing board games helped to pass the time during lockdowns, but many started exploring videos on YouTube and purchasing subscriptions to video-streaming platforms like Netflix and Amazon Prime, for example: “I ended up getting BritBox and Amazon Prime so that we would be able to see other shows. For a long period, there weren’t any new shows to watch so I had to find something else. I also have watched a number of YouTube videos. There are some things that I enjoy and that’s the only way that I can get access to it” (Participant 7, male, 72 years).

For many, the alternative to using digital technology to remain connected with friends and family would be isolation and loneliness. For example, using Zoom, sending text messages, and receiving emails from loved ones made the pandemic lockdowns somewhat tolerable:

“[Technology] has been necessary because otherwise, we would feel completely isolated. We wouldn’t be able to have the contacts that we do. It has made life much more bearable” (Participant 7, male, 72 years). One participant reflected on the loneliness she would have felt on Mother’s Day, a holiday usually celebrated with her children, if she did not connect virtually with them: “[My kids] keep connected with me all the time and you wonder ... If we didn’t have the internet, I think I would have been very lonely. I have five children and on Mother’s Day I heard from all of them. If we didn’t have the internet, I would’ve been very lonely” (Participant 1, female, 92 years). These modes of communication provided participants a sense of “normalcy” in terms of remaining connected through hobbies, meeting grandchildren and social groups. Virtual social connections helped participants limit feelings of isolation and loneliness, while increasing their digital literacy skills in digital technologies such as smartphones, tablets, and laptops, as well as platform such as FaceTime, Zoom and Skype.

6. Discussion

Through the analysis of findings from exploratory semi-structured interviews with older adults who, just before the COVID-19 pandemic, self-identified as occasional or non-users of digital technology, we explored how their relationship with digital technology may have changed during the pandemic and its implication on social connection and access to services. Older people have varying relationships with digital technology. Some find themselves as frequent users of digital technology, engaging with online social and service opportunities for reasons such as value, usability, affordability, accessibility, support, independence, experience and confidence (Lee & Coughlin, 2015). Others are limited in their technology use by factors such as lack of experience and knowledge (Reneland-Forsman, 2020), hesitation to try new technology (Quan-Haase et al., 2014), distrust of websites (Gatto & Tak, 2008) and cognitive/physical declines (Berkowsky et al., 2018). The present analysis strengthens the understanding of the relationship between older adults and digital technology use by exploring how the COVID-19 pandemic may have impacted the use of digital technology – specifically among older people who self-identified, pre-pandemic, as non-users. In this way, our study filtered out participation from the many older people who were adept with digital technologies prior to the pandemic, and looked exclusively at how the isolation and dramatic changes associated with the pandemic affected those who did not use these technologies regularly. Our findings tell a story both of resilience and challenge – older people were both extremely isolated, given their limited digital engagement during a time when most things were forced to go online, but also showed resilience in how they were often able to adapt to and learn about our newly and increasingly digital world. Specifically, we show that many participants started to use internet-based services, smartphones and tablets in their everyday lives during the pandemic, intentionally seeking to become more digitally engaged to remain virtually connected. Other participants continued to resist using digital technology, providing further evidence for Xie et al. (2020)’s concept of a triple exclusion. The present study’s parsing out this specific group of older adults who identified as non-users of digital technology (pre-pandemic) is a unique contribution to the literature, in that most research on aging and digital literacy that begun after the pandemic started did not explicitly differentiate between participants who always were tech-savvy and those who become so (or moved in that direction) during the pandemic.

As noted by Xie et al. (2020), older individuals faced a triple jeopardy (exclusion) during the pandemic, including a heightened risk of contracting the COVID-19 virus, less likelihood of accessing services online and an increase in social isolation and loneliness. Findings from our exploratory analysis strengthen this concept by revealing how these three dimensions of exclusion resulted in the precarity of older adults who were non-users of digital technology. The precarity in this form relates to the risk of exposing older adults to possible situations where

they could have contracted the virus (e.g., in-person services) and the inability for them to independently access some essential community services (e.g., COVID-19 vaccine online booking). Paired with their limited digital technology skills and decreased physical contact, this new layer of precarity during the COVID-19 pandemic demonstrated in our findings saw some older adults feeling excluded from society and community service delivery due to age and their resistance to change.

For older people who continued not to use digital technologies throughout the pandemic, our findings demonstrate that a limited relationship with technology during a global event that shifted many facets of life to online platforms posed challenges to individuals, including their ability to access services and support, furthering how precarious they were. Those unable to or not wishing to access online services such as banking or vaccination appointments, for example, were often put in situations where they were either at more risk of contracting the virus or limited in their ability to access vital community services.

For those who began to increase their usage of digital technology during the pandemic, the present analysis demonstrates how an increased relationship with digital technology during the pandemic helped older adults to push back against the triple exclusion and thus against their risk of precarity. Our findings demonstrate that older adults who embraced technology during the pandemic and began to use it both for socialization and obtaining services were not only able to remain connected, but were at a lower risk of COVID-19 related precarity. Accessing services online reduced the risk of being in an environment where people may have been exposed to the virus. Additionally, while the literature points to many factors that may deter hesitant older adults from adopting digital technology (Berkowsky et al., 2018; Gatto & Tak, 2008; Quan-Haase et al., 2014; Reneland-Forsman, 2020), during the COVID-19 pandemic, the motivation to connect with friends and family virtually seemed, for many, to have taken precedence. Our analysis demonstrates that while older adults may be physically isolated from loved ones during the pandemic (due to lockdown, physical distancing measures and stay-at-home orders), technology such as smartphones and video conferencing platforms ensured that they did not become socially isolated.

Digital technology provides an avenue for social connection and inclusion, allowing older adults to connect with family (no matter the geographical divide) and remain connected with their communities, groups and hobbies. Not only do these forms of digital technology help with social isolation, but they also acted as experience and skills development opportunity through digital literacy enhancement, ensuring that people felt comfortable using technology during and potentially after the pandemic. The relationships with digital technology expressed by self-identified limited (older) users of technology during the pandemic, outlined in our findings, pushes back against the triple exclusion that many older people faced during the pandemic. Using and practicing digital technology helped older people gain new skills, feel more comfortable and confident accessing online services and supports and remain connected with social support networks. Not only were older people able to feel less socially isolated and access necessary community services, but they were then able to lower their risk of precarity of contracting the virus and experience adverse health effects as a result.

7. Limitations

While telephone interviews were necessary at the time of data collection due to provincially mandated lockdowns, this method of interview made it challenging to develop a researcher-participant rapport. Although the researcher conducting the telephone interviews was the lead researcher (and interviewer) on the pre-pandemic study (Wells, 2020), many participants were still apprehensive about participating. Conducting interviews over the telephone also led to some individuals declining participation all together, citing problematic hearing issues while on the telephone. While telephone interviews provide convenience and increased privacy for participants, future research

should prioritize providing alternative interview methods to increase accessible participation.

Additionally, while the insights provided in this paper offer an understanding of the changing relationship between older adults who identified as occasional or non-users and digital technology during the COVID-19 pandemic, due to the small sample size and the case study nature of the study, the findings are not representative of the perspectives of all older adults who self-identify as occasional or non-users of digital technology in Canada or internationally. Future research should incorporate the perspectives of older adults across the range of digital user typologies conceptualized by Quan-Haase et al. (2018), to expand on and complement the present analysis, and should consider the experiences of racialized and marginalized populations of older adults. To understand the experience across different geographical locales, as noted by (Colibaba, Skinner, & McCrillis, 2021), future research should include the experiences of older people living in rural and remote areas, given rural challenges associated with technology access and connectivity (Berg et al., 2017; Warburton et al., 2013).

8. Concluding comments

This paper advances knowledge on the relationships with technology among older people who self-identified as occasional and non digital technology users just prior to the onset of the pandemic through interviews conducted following the third wave of COVID in Ontario, Canada. By understanding how the relationship between older adults and digital technology use may have changed during the pandemic, the findings strengthen our understanding of the implications of the triple exclusion (Xie et al., 2020) and the ways that digital literacy and technological adoption pushed back against the risk of precarity experienced by some older adults during the pandemic. Findings show that by increasing experience, skills and knowledge of digital technology and using it to connect with friends and family, older participants felt more connected and less excluded during the pandemic.

While the findings in this study show the adaptability of older people (to digital technology) even among those who previously were resistant, the COVID-19 pandemic saw digital technology adoption in many cohorts of the population, including using it for online learning and education (Adedoyin & Soykan, 2020), to shift from in-person to at-home working environments (Lal et al., 2021) and to connect with family and friends (Shan et al., 2020). However, when examining the adaptability of older adults during the pandemic, especially those who either used technology in a limited capacity, or did not use digital technology at all prior, we saw individuals go out of their comfort zones to remain connected with family, friends, social groups and hobbies, learning new skills to stay connected. These findings illustrate the need for communities to continue to support the digital literacy skills development of older adults and to ensure adequate resources are available (Moore & Hancock, 2020), even as the number of older people who cannot or choose not to use technology steadily declines (Faverio, 2022). Additionally, it is increasingly important to understand and highlight how so many older adults were resilient enough to independently address exclusion and precarity during large-scale global crises such as the pandemic, often with limited support.

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CRediT authorship contribution statement

Amber Zapletal: Conceptualization, Methodology, Writing – review & editing. **Tabytha Wells:** Conceptualization, Methodology, Writing – review & editing. **Elizabeth Russell:** Conceptualization, Methodology, Writing – review & editing. **Mark W. Skinner:** Conceptualization,

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Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

References

- Adedoyin, O. B., & Soykan, E. (2020). Covid-19 pandemic and online learning: The challenges and opportunities. *Interactive Learning Environments*, 1–3. <https://doi.org/10.4324/9781003269625-11>
- Berg-Weger, M., & Morley, J. E. (2020). Loneliness and social isolation in older adults during the COVID-19 pandemic: Implications for gerontological social work. *The Journal of Nutrition, Health & Aging*, 24(5), 456–458.
- Berg, T., Winterton, R., Petersen, M., & Warburton, J. (2017). 'Although we're isolated, we're not really isolated': The value of information and communication technology for older people in rural Australia. *Australasian Journal on Ageing*, 36(4), 313–317.
- Berkowsky, R. W., Sharit, J., & Czaja, S. J. (2018). Factors predicting decisions about technology adoption among older adults. *Innovation in Aging*, 1(3), 1–12.
- Betts, L. R., Hill, R., & Gardner, S. E. (2019). "There's not enough knowledge out there": Examining older adults' perceptions of digital technology use and digital inclusion classes. *Journal of Applied Gerontology*, 38(8), 1147–1166.
- Carvalho, D., Bessa, M., Oliveira, L., Guedes, C., Peres, E., & Magalhães, L. (2012). New interaction paradigms to fight the digital divide: A pilot case study regarding multi-touch technology. *Procedia Computer Science*, 14, 128–137.
- Chen, A. T., Ge, S., Cho, S., Teng, A. K., Chu, F., Demiris, G., & Zaslavsky, O. (2021). Reactions to COVID-19, information and technology use, and social connectedness among older adults with pre-frailty and frailty. *Geriatric Nursing*, 42(1), 188–195.
- Colibaba, A., Skinner, M. W., & McCrillis, E. (2021). A critical view of older voluntarism in ageing rural communities: Prospect, precarity and global pandemics. In M. Skinner, R. Winterton, & K. Walsh (Eds.), *Rural Gerontology: Towards Critical Perspectives on Rural Ageing* (pp. 287–299). London: Routledge.
- Davidson, J., & Schimmele, C. (2019). *Evolving internet use among Canadian Seniors. Statistics Canada*. <https://www150.statcan.gc.ca/n1/pub/11f0019m/11f0019m2019015-eng.htm>.
- DiMaggio, P., Hargittai, E., Neuman, W. R., & Robinson, J. P. (2001). The Internet's effects on society. *Annual Review of Sociology*, 27, 307.
- Elimelech, O. C., Ferrante, S., Fortin-Bédard, N., Lettre, J., Raymond, E., Bussière, E.-L., Lappierre, N., Fieta, J., Vincent, C., Duchesne, L., Ouellet, M.-C., Gagnon, E., Tourigny, A., Lamontagne, M.-E., & Routhier, F. (2021). Impact of the COVID-19 pandemic on older adults: Rapid review. *JMIR Aging*, 4(2), Article e26474.
- Faverio, M. (2022). *Share of those 65 and older who are tech users has grown in the past decade*. Pew Research Centre. <https://www.pewresearch.org/fact-tank/2022/01/13/share-of-those-65-and-older-who-are-tech-users-has-grown-in-the-past-decade/>.
- Frydman, J. L., Gelfman, L. P., Goldstein, N. E., Kelley, A. S., & Ankuda, C. K. (2022). The digital divide: Do older adults with serious illness access telemedicine? *Journal of General Internal Medicine*, 37, 984–986.
- Gatto, S. L., & Tak, S. H. (2008). Computer, internet, and e-mail use among older adults: Benefits and barriers. *Educational Gerontology*, 34(9), 800–811.
- Government of Ontario. (2021). *COVID-19: Stop the spread*. <https://www.ontario.ca/page/covid-19-stop-spread>.
- Grenier, A., Phillipson, C., & Settersten, R. A. (Eds.). (2020). *Precarity and ageing: Understanding insecurity and risk in later life*. Bristol: Policy Press.
- Haase, K. R., Cosco, T., Kervin, L., Riadi, I., & O'Connell, M. E. (2021). Older adults' experiences with using technology for socialization during the COVID-19 pandemic: Cross-sectional survey study. *JMIR Aging*, 4(2), Article e28010.
- Hargittai, E., Piper, A. E., & Morris, M. R. (2019). From internet access to internet skills: Digital inequality among older adults. *Universal Access in the Information Society*, 18(4), 881–890.
- Hilbert, M. (2020). Digital technology and social change: The digital transformation of society from a historical perspective. *Dialogues in Clinical Neuroscience*, 22(2), 189–194.
- Hill, R., Betts, L. R., & Gardner, S. E. (2015). Older adults' experiences and perceptions of digital technology: (Dis)empowerment, wellbeing, and inclusion. *Computers in Human Behavior*, 48, 415–423.
- Lal, B., Dwivedi, Y. K., & Haag, M. (2021). Working from home during COVID-19: Doing and managing technology-enabled social interaction with colleagues at a distance. *Information Systems Frontiers*. <https://doi.org/10.1007/s10796-021-10182-0>
- Lee, C., & Coughlin, J. F. (2015). Older adults' adoption of technology: An integrated approach to identifying determinants and barriers. *Journal of Product Innovation Management*, 32(5), 747–759.
- McMellon, C. A., & Schiffman, L. G. (2002). Cybersenior empowerment: How some older individuals are taking control of their lives. *Journal of Applied Gerontology*, 21(2), 157–175.
- Merchant, R. A., Liu, S. G., Lim, J. Y., Fu, X., & Chan, Y. H. (2020). Factors associated with social isolation in community-dwelling older adults: A cross-sectional study. *Quality of Life Research*, 29(9), 2375–2381.
- Moore, R. C., & Hancock, J. T. (2020). Older adults, social technologies, and the Coronavirus pandemic: Challenges, strengths, and strategies for support. *Social Media + Society*, 6(3), 2–5.
- Morrow-Howell, N., Galucia, N., & Swinford, E. (2020). Recovering from the COVID-19 pandemic: A focus on older adults. *Journal of Aging & Social Policy*, 32(4–5), 526–535.
- Mueller, A. L., McNamara, M. S., & Sinclair, D. A. (2020). Why does COVID-19 disproportionately affect older people? *Aging (Albany NY)*, 12(10), 9959–9981.
- Murthy, V. H. (2020). *Together: Loneliness, health, and what happens when we find connection*. New York: HarperCollins.
- Niehaves, B., & Plattfaut, R. (2014). Internet adoption by the elderly: Employing IS technology acceptance theories for understanding the age-related digital divide. *European Journal of Information Systems*, 23(6), 708–726.
- Olsen, K. E., O'Brien, M. A., Rogers, W. A., & Charness, N. (2011). Diffusion of technology: Frequency of use for younger and older adults. *Ageing International*, 36(1), 123–145.
- Quan-Haase, A., Martin, K., & Schreurs, K. (2014). Not all on the same page: E-Book adoption and technology exploration by seniors. *Information Research: An International Electronic Journal*, 19(2), 2.
- Quan-Haase, A., Williams, C., Kicevski, M., Elueze, I., & Wellman, B. (2018). Dividing the grey divide: Deconstructing myths about older adults' online activities, skills, and attitudes. *American Behavioral Scientist*, 62(9), 1207–1228.
- Ramos Garcia, K., Rodrigues, L., Pereira, L., Busse, G., Irbe, M., Almada, M., Christensen, C., Midão, L., Dias, I., Heery, D., Hardy, R., Quarta, B., Magdalena Poulain, M., Bertram, M., Karnikowski, M., & Costa, E. (2021). Improving the digital skills of older adults in a COVID-19 pandemic environment. *Educational Gerontology*, 47(5), 196–206.
- Reneland-Forsman, L. (2020). 'Borrowed access' – the struggle of older persons for digital participation. *International Journal of Lifelong Education*, 37(3), 333–344.
- Russell, E., Skinner, M. W., & Fowler, K. (2022). Emergent challenges and opportunities to sustaining age-friendly initiatives: Qualitative findings from a Canadian age-friendly funding program. *Journal of Aging & Social Policy*, 34(2), 198–217.
- Ryser, L., & Halseth, G. (2012). Resolving mobility constraints impeding rural seniors' access to regionalized services. *Journal of Aging & Social Policy*, 24(3), 328–344.
- Seifert, A. (2020). The digital exclusion of older adults during the COVID-19 pandemic. *Journal of Gerontological Social Work*, 63(6–7), 674–676.
- Seifert, A., Cotton, S. R., & Xie, B. (2021). A double burden of exclusion? Digital and social exclusion of older adults in times of COVID-19. *The Journals of Gerontology Series B*, 76(3), 99–103.
- Shan, S. G. S., Nogueiras, D., van Woerden, H. C., & Kiparoglou, V. (2020). The COVID-19 pandemic: A pandemic of lockdown loneliness and the role of digital technology. *Journal of Medical Internet Research*, 22(11), 1–7.
- Statistics Canada. (2016). *Peterborough, CTY [census division]. Census profile. 2016 census. Statistics Canada catalogue No. 98-316-C2016001*. Ottawa. Released <https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/index.cfm?Lang=E>. (Accessed 29 November 2017).
- Szabo, A., Allen, J., Stephens, C., & Alpass, F. (2019). Longitudinal analysis of the relationship between purposes of internet use and well-being among older adults. *The Gerontologist*, 59(1), 58–68.
- Vargo, D., Zhu, L., Benwell, B., & Yan, Z. (2020). Digital technology use during COVID-19 pandemic: A rapid review. *Human Behavior and Emerging Technologies*, 3(1), 13–24.
- Warburton, J., Cowan, S., & Bathgate, T. (2013). Building social capital among rural, older Australians through information and communication technologies: A review article. *Australasian Journal on Ageing*, 32(1), 8–14.
- Weil, J., Kamber, T., Glazebrook, A., Giorgi, M., & Ziegler, K. (2021). Digital inclusion of older adults during COVID-19: Lessons from a case study of older adults technology services (OATS). *Journal of Gerontological Social Work*, 64(4), 643–655.
- Wellman, B., Quan-Haase, A., Boase, J., Chen, W., Hampton, K., Díaz, I., & Miyata, K. (2003). The social affordances of the internet for networked individualism. *Journal of Computer-Mediated Communication*, 8(3), JCMC834.
- Wells, T. (2020). *The Digital Divide: Exploring Internet Use Among Older People*. Peterborough: B.A. Honours Thesis.
- Xie, B., Charness, N., Fingerma, K., Kaye, J., Kim, M. T., & Khurshid, A. (2020). When going digital becomes a necessity: Ensuring older adults' needs for information, services, and social inclusion during COVID-19. *Journal of Aging & Social Policy*, 32(4–5), 460–470.