Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

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Reactions to COVID-19, information and technology use, and social connectedness among older adults with pre-frailty and frailty

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ABSTRACT

The emergence of Coronavirus Disease 2019 (COVID-19) and social distancing measures has serious implications, particularly those age 65 and older. We performed a qualitative analysis of online discussion data generated by older adults with pre-frailty and frailty while subject to a state stay-at-home order. We provided participants with prompts relating to the public health emergency, collected 60 posts, and analyzed them using a general inductive analytic method. We report on: (1) the impact of the pandemic on daily life; (2) preparedness, perceptions, and behavior; (3) information and technology use; and (4) social impacts. Participants' lives of changed in many ways, including the adoption of precautionary measures and altered daily routines. Participants experienced negative emotional consequences including stress, worry, and anxiety. Information and technology use kept participants informed and connected. Participants reported varying degrees of preparedness. Our study findings provide insight into ways to support vulnerable older adults in pandemic circumstances.

Introduction

Since December 2019, Coronavirus Disease 2019 (COVID-19) has become a significant public health crisis worldwide. Due to the absence of pharmaceutical interventions for COVID-19, countries all over the world are implementing different non-pharmacological public health strategies, including isolation, quarantine, social distancing, and community containment.[1,2] Though the preventive strategies might lower exposure risks, there may also be negative impacts on people already at risk, such as people age 65 and older and in particular, those living with disability, multimorbidity, and geriatric syndromes such as frailty. Frailty is a geriatric syndrome characterized by an increased susceptibility to health events which can develop in adults at any age, but is more prevalent in people age 65 and older.[3] Frailty can be exacerbated by social factors such as social isolation and loneliness.[4] In addition, frail older adults are more susceptible to COVID-19 complications and subsequent hospitalizations[5] and are at a lower priority for critical resources such as ventilators and ICU beds.[6] In this study, we specifically focused on a population at risk, those who experience pre-frailty or frailty, to examine the ways that COVID-19 has affected them. We explore four topics: impacts on daily life, reactions to COVID-19, information and technology use, and social connectedness.

In this highly dynamic situation, people are constantly being exposed to new information and recommendations through different information sources. This information may affect people's intention to engage in and adopt preventive behaviors such as social distancing, hand washing, and sanitization of surfaces. Previous research has argued that prevention efforts should take into account public perceptions. Beliefs such as the efficacy of frequent handwashing, non-availability of vaccines, and chance of having a large scale outbreak have been associated with more frequent handwashing.[7] Information that "personalizes" an epidemic, causing a person to feel that they might be affected, can also lead to more preventive practices.[8] There are also other factors that may affect a person's willingness to engage in preventive behaviors during epidemics. Whereas perceived severity and self-efficacy are positively associated with self-isolation intention,[9,10] response cost is negatively associated.[10] With regard to older adults, those who perceived greater personal vulnerability, greater self-efficacy, greater confidence in local health authorities, and had lower educational attainment were more likely to adopt preventive behaviors during the SARS outbreak.[11] Social distancing is

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one of the most common preventive strategies that aims to minimize in-person contacts, but might increase risks of social isolation.

Social isolation is common among older adults, with 24% of community-dwelling older adults being characterized as socially isolated in the 2011 National Health and Aging Trends Study.[12] Social disconnectedness and perceived loneliness have also been associated with negative consequences for physical and mental health, including more severe symptoms of depression and anxiety[13] and lower levels of self-rated physical health.[14] In situations where people are engaging in social distancing to prevent the spread of disease, older adults may disproportionately be affected due to loss of social contact outside of the home through grocery shopping, community centers, and places of worship.[15–17] Thus, in addition to physical health, there is great concern about the effect that the pandemic can have on the mental health and wellbeing of older adults.[18] Information and communication technologies can mitigate these risks by providing access to information about preventive behaviors, and providing opportunities for social connectedness. Information and communication technology use has been positively associated with social support, social connectedness, and social isolation among older adults, though there are questions about the persistence of these effects.[19]

The literature investigating public perceptions and behaviors of epidemic/pandemic circumstances has generally employed quantitative approaches. While quantitative research is useful for answering questions about "what", "how much", and "why", qualitative research focuses on questions of "why" and "how".[20] Qualitative research also facilitates the study of "real life" behavior.[20] There is a need to better understand how vulnerable populations, such as those who experience pre-frailty and frailty, experience and address challenges in pandemic situations. In this study, we take a qualitative approach to this research question using data collected via an online discussion forum in March 2020 when a mandatory stay-at-home order was first put in place in Washington state. The discussion focused on four topics of interest: impact of the pandemic on daily life; reactions to COVID-19 in terms of preparedness, perceptions, and behavior; information and technology use; and social impacts of the epidemic.

Methods

Study design

We performed a qualitative analysis of online discussion content from a pilot study of an online problem solving therapy intervention for older adults with pre-frailty and frailty (defined in Setting and Participants). Previous research has shown that online focus groups can be effectively leveraged to collect rich data in situations where people are separated by distance.[21] As the pandemic was beginning to unfold, social distancing measures were being put in place; a focus group was an ideal way to seamlessly gather people's reactions to the pandemic.

Setting and participants

The study participants were recruited from multiple venues in the greater Seattle area frequented by older adults, including retirement communities, public libraries, and community centers. We also used a university recruitment website. We aimed to recruit a target sample of 10 people, as previous research has shown that larger discussion forums tend to have a high percentage of "lurkers", or persons who read, but do not participate in discussions.[22] We recruited a smaller group size so that all participants would have an opportunity to have discussions with one another in a more intimate group setting.

The inclusion criteria were: age 65 and older, have Internet access and meet at least one of frailty criteria from the short Women's Health Initiative (sWHI) frailty measure.[23] The sWHI is a valid frailty measure that has the following self-report criteria: physical activity, fatigue, weight loss, and physical function. People meeting at least one of the criteria are judged to be pre-frail and those meeting at least two are judged to be frail. The sWHI measure was previously compared with Fried's CHS frailty phenotype measure for prediction of health outcomes. The sWHI measure performed well and was described as "practical for use in settings with limited resources."[23] Despite its nomenclature, the sWHI frailty measure has been used in prior research involving samples including both men and women.[24,25]

Data collection

This study is part of pilot research for an online problem solving therapy intervention to assist older adults with health management. As a part of this study, we collect pre- and post-intervention data, and engage participants in an eight-week long online discussion in which they share their health management experiences as well as engage in a didactic component based on problem solving therapy.[26]

Prior to the start of the study, we ask participants to take part in "icebreakers" in which they discuss diverse topics and get to know one another. In this article, we focus on the content of these three icebreakers which were posted online in the time period March 9th–24th 2020, just after a state stay-at-home order had been issued. As such, the "icebreakers" were in response to the local developments and were focused on the four themes of interest and relevance to the wellbeing of older adults in the midst of evolving COVID-19 situation: influence on daily life, information and technology use, prevention behaviors, and social connectedness.

The online discussion took place in a private discussion group that was created on Discourse, a discussion platform in which it is possible to create public and private communities for different purposes.[27] The discussion appeared in the form of a discussion forum, in which participants could respond to the weekly discussion prompt, the moderators, and each other, with replies appearing below the content being responded to. The study was moderated by two members of the research team, who provided encouragement and affirmation, but maintained a neutral stance. Every week, we provided participants with three successive prompts (Fig. 1). All procedures for the study were approved by the Institutional Review Board at the University of Washington.

Health-related measures

We collected data concerning the loneliness, perceived stress, and health-related quality of life of participants. For loneliness, we used the 3-item Loneliness Scale,[28] a shortened version of the 20-item Revised UCLA Loneliness Scale.[29] We employed the Perceived Stress Scale[30] to assess the level of stress that participants experienced. The RAND-36, a commonly used measure that has been used to assess quality of life among a variety of populations, including those with frailty and pre-frailty, was also used.[31,32]

Data analysis

We analyzed the posts using a general inductive analytic method, which involves the following steps: preparation of the data files, close reading of the text, creation of codes, and continuing revision and refinement of the codes and code hierarchy.[33,34] First, we exported discussion data from Discourse into Dedoose, a qualitative data analysis software.[35] We included the discussion data for all weeks pertaining to COVID-19. Only the data produced by participants were included, as the moderators, who were part of the research team, did not contribute content that would inform the research aims.

Prior to coding, we reviewed the transcripts to familiarize themselves with them. Two members of the research team independently coded the data, identifying codes relating to the topics of interest. Then three members of the research team met in successive weeks to revise

#VOCALE

Ice Breaker #3

Lately, there has been a lot of news and concern about the novel coronavirus (COVID-19). This week, we will discuss how this has affected all of us. Consider the following questions:

- Where have you been hearing/reading about COVID-19?
- How do you feel about what you have been hearing or reading?
- Do you feel prepared to deal with the situation?
- Is there information that you wish that you had?

#VOCALE

Ice Breaker #4

This week, let's consider how prepared we are to deal with the novel coronavirus (COVID-19).

- Do you feel worried about COVID-19?
- What, if anything, have you done in response to the current situation?
- Do you feel isolated due to the events of the recent weeks?
- How has your life changed in recent weeks due to COVID-19?

#VOCALE

Ice Breaker #5

There has been a lot of breaking news lately and change is in the air! For this week, let's discuss change and ways to stay connected.

- Medicare will now provide tele-health coverage, enabling people to receive care at home. Is this something that you would take advantage of? Why or why not?
- Resources such as Agingcare.com offer discussion forums, including a Caregiver Forum that enable people to share health-related information and problem solve. Have you previously used any online discussion forums? Would you trust the information that you encounter on these forums?
- Do you use Facebook or any other social media?

Bonus: The government will supposedly give most Americans a check for $1,200 in the near future. What would you do with this money?

Fig. 1. COVID-19 icebreaker prompts.

the coding scheme and resolve disagreements. To ensure the quality of the coding, particular attention was paid to reconciling the coding in terms of reduction of overlap and redundancy between categories.[34]

The notion of reliabity in qualitative research can be challenging due to differences in qualitative paradigms; however, the essence of reliability in qualitative research lies with consistency, whereas validity in qualitative research refers to the appropriateness of the tools, processes and data employed in analysis.[36] In this work, we employed multiple techniques for ensuring validity. We endeavored for validity in *design consideration,* through triangulation; in *data generation,* by performing verbatim transcription and elucidating data collection and preparation decisions; in *analysis,* by performing literature review to inform our coding scheme; and in *presentation*, by providing evidence, through participant quotations, to support interpretations.[37]

Reliability was ensured through constant comparison, discussion amongst the two coders and senior researcher performing the analysis as a form of triangulation, and a proper audit trail of our qualitative coding and analysis process.[36,38] We include our final coding scheme in the Appendix.

Results

Sample

Over the course of the three weeks of COVID-19 related discussion, we collected 60 posts from 10 participants. Sample characteristics are provided in Table 1, and health-related measures, in Table 2. Most participants were female and White. Sixty percent met the criteria for pre-frailty. Perceived stress averaged at 12.7 (SD=7.7) points, which is consistent with the mean for older adults in the United States.[39]

Influence on daily life

The participants in our study reported engaging in preventive behaviors, including social distancing, hand washing and sanitizing, mask wearing, taking precautionary measures while grocery shopping, exercise, and taking supplements, which had various impacts on their lives.

At the outset, participants engaged in different types of social distancing practices. First, they tried staying at home: "I've mostly remained at home and when I do go out it is generally outside where I'm not in close proximity to others." (P301) Some participants reported maintaining a distance from others while outside their homes: "Keeping 6 feet from a neighbor to chat is easy to do now knowing the risks." (P302) Changes in policy in participants' living environments also played a role in distancing: "I live in a large retirement place which is emphasizing distancing. We get a meal a day delivered to our door. . ." (P309)

Participants reported adopting the habit of frequently washing and sanitizing their hands:

"I am taking precautions (limiting crowds; frequent hand-washing. . .)." (P304)

Table 1
Sample characteristics (N = 10).

Characteristic	Mean (SD)	Range	n(%)
Age	75.3 (6.25)	66–84	10 (100)
Weight (lb)	172.9 (33.25)	135–235	10 (100)
Height		5′1″–6′1″	10 (100)
Characteristic			n(%)
Sex			
Male			3 (30)
Female			7 (70)
Race*			
White			8 (80)
Hispanic/ Latino			0.5 (5)
Asian/ Pacific Islander			1 (10)
American Indian or Alaskan Native			0.5 (5)
Education			
Vocational or Associate degree			2 (20)
Baccalaureate degree			2 (20)
Master's degree			6 (60)
Income			
$20,000 to $39,999			1 (10)
$60,000 to $79,999			2 (20)
$80,000 to $99,999			3 (30)
$100,000 to $119,999			2 (20)
$120,000 or more			1 (10)
Don't know or prefer not to answer			1 (10)
Comfort level with computers			
Somewhat comfortable			3 (30)
Very comfortable			7 (70)
Frailty classification			
Pre-frail (1)			6 (60)
Frail (2+)			4 (40)

*One participant selected two options.

Table 2
Health-related measures (N = 10).

Characteristic	Mean (SD)	Range	n(%)
Perceived Stress Scale	12.67 (7.65)	2–23	9 (90)
UCLA 3-Item loneliness	4.3 (1.42)	3–6	10 (100)
RAND SF-36 Quality of Life (Physical Function)	65 (25.6)	30–100	10 (100)

"... using disinfectant wipes and hand sanitizer as needed..." (P302)

Many participants reported hand sanitizers being out of stock everywhere: "I just 'scored' a tiny spray bottle of hand sanitizer I couldn't find it anywhere...I felt quite lucky." (P301) Several participants reported wearing gloves instead: "I wear my own gloves when I go out and wash them when home." (P309)

Participants also took various precautionary measures while grocery shopping, including wearing masks and making sure that grocery lists were conducive to getting in and out quickly: "I will awaken bright and early to shop smartly with my mask on and grocery list organized by items." (P304) They often considered difficult changes to their daily routines: "I called my local grocery store today to find out when I could go when there would be fewer people. Their suggestion was 5AM! Yikes! I'm barely awake at 5." (P301) One participant noted how much daily life had changed: "Life is now truly different. I have to carefully plan times to shop at the store..." (P302)

Participants reported stopping going to gyms and group exercises: "To be safe to stay away from the gym and exercise classes which were closed. Now feeling sluggish." (P303) Exercising outdoors was an alternative: "... going for walks in order to be outside." (P309) Participants reported taking supplements to improve immunity: "Elderberry, Vitamin C, Zinc; sleep, fluids and a good diet are measures I can do to stay healthy." (P304)

Reactions to COVID-19: preparedness, perceptions, and behaviors

The discussion forum also afforded insights into aspects of participants' reactions to pandemic circumstances, including feelings towards COVID-19; sense of preparedness, including scientific understanding of the virus and risk factors; and sense of responsibility.

Most participants expressed negative emotional reactions, including stress, anxiety, and worry, towards COVID-19. Some participants were concerned about COVID-19 because they belonged to a higher-risk group. Also, participants felt anxious about what was to come: "Thinking of the future, it is disheartening to think that the period of infections could run a year and a half or so, until the virus dies out-...But we care and caution, we can survive even this time." (P302) Other participants worried about others who had fewer protections or resources, or who had been treated unfairly. "I worry that people will be ostracized or not receive the clinical care they need due to misdiagnosis." (P300) There was a healthcare professional who expressed no worries about COVID-19: "I am not worried about COVID19. I have concerns and fell [sic] that we all need to be vigilant and knowledgeable and follow guidelines for prevention." (P300)

Participants varied in terms of the extent to which they felt prepared for the pandemic. Most participants reported feeling that they were not well-prepared, with one of the most common reasons being the limitations of current scientific knowledge of the disease: "They don't have much data so it is difficult to know what to do. No, I don't feel well prepared at this point but I am trying to get in the habit of sanitizing." (P301) Overall, participants were aware of risk factors for COVID-19 and associated preventative approaches. For example, many participants mentioned older age and underlying health conditions as risk factors: "I am in my late 70 s with several compromising health problems, so I know that I am in the high risk group." (P302) Participants were aware that daily routines that could put them at risk: "with social activities that draw me out, with the need to shop and run errands, I know that the risk of contamination is all too real." (P302)

Some participants felt that they had done what they could to prevent illness, but recognized that they did not have full control: "I feel somewhat prepared to prevent the illness but I know that other's actions impact our well-being." (P304) Participants' personal situations (e.g., not having a flu shot in the past year) have also affected their sense of preparedness. Reliable information from trustworthy sources was a factor that improved participants' sense of preparedness: "The information from people of the science community do prepare me to be cautious and vigilant." (P303)

Participants expressed concern for people and society and opinions about how individuals could contribute, as well as a sense of responsibility as a member of the community and/or mentioned ways of supporting the community (e.g., information sharing, taking care of others, conveying a message towards the public):

"I have reached out to vulnerable neighbors to see how I might assist them." (P300)

"I am very concerned for our large homeless community in Seattle." (P309)

Some participants reached out to share helpful information with other participants via the online discussion: "If you received the Sunday Seattle Times, there are two articles that are very informative..." (P304) Some participants took the responsibility to share information with family and friends. "I am doing what I can to deal with the situation, including taking precautions and helping others to obtain accurate information so they can take responsibility to be a part of the solution." (P300) Some participants also felt it was their responsibility to educate others about inappropriate behaviors: "Keep your friends and relatives accountable during this Pandemic. I have had to have a very direct conversation with my friend because she is taking unnecessary dangerous risks which will impact the course of this virus." (P304)

Information and technology use

Participants reported obtaining information about COVID-19 from online sources including news sources, government agencies (i.e., Washington State Department of Health, Centers for Disease Control and Prevention), and social media (i.e., Facebook, Instagram). Though some participants mentioned receiving information through family members, healthcare workers, or reviewing information from textbooks, more participants mentioned seeking information through online sources or public media.

Often, participants shared opinions regarding the trustworthiness or helpfulness of online resources. The participants were likely to discern the information as credible if it was from a publicly known resource (i.e., King County Public Health, CDC) or a figure whom they trust (e.g., healthcare workers). The trustworthiness of the information was weighed depending on the perceptions of the information source, where participants regarded information as less trustworthy if opinion was involved: "If it is just opinion, I tend to not give a lot of weight unless it is from someone whose opinion I trust." (P301) Participants considered the information helpful when the content of the information was directly relevant to their lives: "Thanks for the mention of agingcare.com. I checked it out and find some good information and support from the participants. I could have used the info last year with serious illness in the family." (P302) One participant said that they avoided news when it was disconcerting: "I watch the news but it can be overwhelming as the newscaster's tone seems high pitched and on the verge of hysteria. If I am watching the news I ask my husband to switch the channel when it is causing me anxiety." (P304)

The discussion content indicated that technology played a large role in the daily lives of the participants, at least during the pandemic. Technologies, such as telephone, internet, and email were used to browse information, maintain social connections, and shop. Also, many participants said that online communication platforms (e.g., Facebook) and online videoconferencing applications (e.g., Zoom) helped them to stay connected with their family and the community amidst COVID-19.

Participants were also asked to share their thoughts about adopting telehealth. Some participants shared their prior experience with telehealth and expressed that they would continue to use it with Medicare telehealth coverage. Overall, many of the participants thought positively about telehealth and expressed their willingness to use it should they require medical attention with issues that are "non-severe" (e.g., prescription refill, follow-up appointments).

Social isolation, social support, and social connectedness

The content that participants contributed confirmed that most participants felt isolated due to pandemic circumstances: "it is very, very isolating." (P305) Participants' sense of isolation was due to less contact with their families, especially grandchildren: "I miss the frequent visits with young grandchildren, their exuberance, the embraces and sharing of love." (P302) Some participants also mentioned missing their friends: "there was no opportunity to see/speak to some of the people I'm used to talking with at lunch. It makes me sad to lose that contact." (P301)

But not all participants felt isolated: "I do not feel isolated. Perhaps because if am an introvert and probably have already been practicing social isolation to some extent for as long as I can remember." (P300) Though they felt isolated, participants still expressed the view that practicing social distancing was necessary: "When you feel isolated remember, by staying home, you are doing a good thing for both yourself and your community." (P307)

Study participants said that they received social support from different sources including family members, their community, and local programs. Many participants said they have received information from family members: "I also have input from 3 daughters and in-law who are all nurses in local hospitals. My several other children have called me frequently to share their info, concerns and advice." (P302) Several participants mentioned that there was support from the community: "My community group Buy Nothing has offered to run errands i.e. grocery shopping etc. There are so many caring individuals out here." (P304) Participants also mentioned local financial support programs: "We got approved for the Utility Discount Program through the City of Seattle…The Swedish Hospital has a financial aid program…I am so glad these programs are available to the public." (P304) Meanwhile, participants offered help to others in the study: "If anyone's income has been impacted there are some good programs out there. I spent the last couple of days completing applications. Let me know if you want help navigating these programs…" (P304)

Social technologies were increasingly used in pandemic circumstances to mediate communication: "Yes, it does feel a bit isolated but I have replaced some direct contact with (1) online communications and (2) phone." (P303) Some participants appreciated having more virtual connections: "…so many in-person meetings have been canceled and we are meeting via teleconference. I really like that. It's a great way to keep in touch and still get work done without having to drive or take the bus which all takes time." (P301)

Discussion

This study showed that pandemic circumstances had a profound effect on the lives of older adults with pre-frailty and frailty. Participants engaged in a range of preventive behaviors, and reported experiencing stress, anxiety, and worry due to COVID-19. Information and technology use kept participants informed and connected. Participants reported varying degrees of preparedness, which seemed to be related to factors such as perceived level of uncertainty and vulnerability. There was also a sense of responsibility and interest in helping others.

The sample of this study is comparable to prior studies of pre-frailty and frailty among older adults. Physical function, a dimension of health-related quality of life, was comparable to the average levels of physical function among pre-frail and frail older adults in the Helsinki businessmen Study ($N = 1815$).[32] Loneliness and perceived stress were also comparable to those reported in previous literature.[40,41]

Using technology to promote connectedness

In our study, most participants reported diminished contact with family and friends. Extant literature has reported that loneliness is associated with increased risk of becoming pre-frail and frail.[4] Prior research with older adults has also reported a relationship between social disconnectedness and social isolation and symptoms of depression and anxiety.[13] On the other hand, social participation, defined as engagement, leisure activities, and social activities, has been associated with lower levels of frailty.[42] Though participants' physical function, loneliness and perceived stress levels were comparable with other populations experiencing pre-frailty and frailty, they still participated actively in online discussion forum and demonstrated, through the content, that they felt that they had support either through their families or their communities.

Given that pandemic circumstances necessitate social distancing and make social disconnectedness and social isolation more concerning in frail older adults who are already at risk, it is particularly important to ensure that there are services in place that can help to maintain connectedness. Participants themselves reported the use of social technologies to connect with family. Other services that traditionally serve older adults through physical locations might also consider providing services online. For example, community centers that serve older adults might consider providing ways to connect online,

which may enable older adults to continue to benefit from social connections that they have made through these venues.

The connectivity of older adults might also be promoted through creating opportunities for older adults to help others in pandemic circumstances. In our study, participants reached out and/or expressed concern for others in various ways. While some were directly able to help those around them such as their family, they also wondered how they might help others that they saw who were having difficulties. There may be ways to channel this energy and concern. For example, services might be developed so that older adults could check in on each other virtually, enabling them to both feel that they are helping others, as well as alleviating their own sense of isolation. Previous research has shown that organizational volunteering is associated with various positive outcomes, including sense of personal contribution, personal benefits, depression, life satisfaction, wellbeing, and lower risk of mortality.[43,44] Previous qualitative research involving persons with frailty has also reported that individuals can find meaning in teaching others to do tasks that they may no longer be able to do themselves, such as gardening,[45] and that feeling connected to the whole could help older adults cope with vulnerability.[46,47]

In addition, in recent months, there has been concern about the emergence of ageist discourses suggesting that perhaps the lives of older people are not as important as younger people, which might contribute to older adults feeling that their lives are not valued or that they are a burden.[16] Services that enable older adults to contribute as well as be recognized for their contributions could not only be of benefit to all, but also serve to combat these stereotypes.

Communication and promotion of preventive behaviors

In our sample, participants' comments reflected that they experienced stress, anxiety, and worry due to COVID-19. Extant literature has reported that perceived severity and vulnerability are positively associated with willingness to engage in preventive behaviors.[9–11] Yet participants demonstrated varying states of perceived preparedness in the face of stress, anxiety, and worry due to uncertainty from the lack of scientific knowledge of COVID-19. The acknowledgement that there were circumstances outside of their control appeared to influence participants' perceptions of the potential effectiveness of preventive behaviors, but not enactment of the behaviors themselves.

It may be useful to consider the important role that information may potentially play here. Previous research about H1N1 has observed that communication under pandemic circumstances can be particularly difficult due to the continually evolving nature of information.[48] In this study, we also saw that older adults perceived uncertainty in the situation, though it did not appear to result in inconsistency in whether they followed prevention guidelines. It may be that high perceived severity encouraged compliance with recommendations, or that participants felt more reassured due to the perceived reliability of the information sources from which they had obtained their information. However, there is potentially a continued need for public health agencies and news sources to strike a balance between emphasizing the gravity of a situation and promoting preventive behavior, and assuaging public fears. There is also a need to ensure that adequate social support is available.

Social distancing and health care

Though social distancing may be necessary for the purpose of disease prevention, such measures can create drastic changes in the daily lives of older adults. During the pandemic, certain hours during the day, mostly early in the morning, have been allocated for older adults so that they can shop groceries while avoiding crowds. Though this policy is well-intentioned, our study showed that some participants had difficulties with these hours, and it might be helpful to consider whether it would be possible to hold senior hours at other times. In developing services intended for older adults (e.g., senior hours), we might consider whether the services meet their needs by soliciting feedback from them and making a continual effort to balance the needs of different members of the population and reduce disparities in access to resources.

Social distancing policies have also had an impact on access to telehealth. The majority of the participants in our study harbored positive views of telehealth and said that they were willing to utilize it as a form of medical care, suggesting that efforts to facilitate its use by older adults are warranted. Efforts could include educational outreach to support older adults in using digital devices, offering telephone visits if unable to utilize devices that allow videoconferencing, or providing affordable broadband for equitable access.[49]

Limitations

Our research has various limitations. First, the small sample size, the majority of the sample being White, and relatively high educational attainment may limit the generalizability of our study findings. Second, our study was based on a sample residing in the northwestern United States; it is possible that participants residing in a different part of the country or the world would have had very different experiences. Additional studies are needed to form a richer understanding of how pre-frail and frail older adults from a variety of backgrounds may cope with the challenges posed by pandemic circumstances.

Given our sample, our goal was not to achieve statistical generalizability, but rather, *transferability*, by employing rich, "thick descriptions" of individuals' health-related experiences to support transfer to similar contexts.[50] In this study, the contextual focus was the COVID-19 pandemic, which created a unique set of circumstances. The goal of our study was to provide a contextualized account of one group of older adults' experiences, that could be used in conjunction with other studies or to inform future research, on diverse impacts of COVID-19 among older adults.

Conclusion

The purpose of this study was to better understand how older adults with pre-frailty and frailty address the challenges they encounter during pandemic circumstances. This study used an online discussion forum and a qualitative data analytic approach to examine the effect of the pandemic on older adults' daily lives, their information and technology use, reactions to COVID-19, and sense of social connectedness. Our findings provide insight into additional support and resources that might be provided to support this vulnerable population in pandemic circumstances.

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Conflicts of interest

We do not have any conflicts of interest to disclose.

Appendix. Coding scheme

Information behaviors, attitudes, and use of technology

Code name	Definition
Source	Where the information comes from. This may include word-of-mouth, mass media, and social media sources, such as Facebook, Reddit, discussion forums and any other social media.
Sharing information	Participants shares their experiences, an information source, or something else related to COVID-19
Attitudes toward information and/or information sources	
Trustworthiness	Trustworthiness of an information source, content, or institution (organization) is discussed.
Helpfulness	Helpfulness of the information.
Attitudes towards tele-health	Participants share their attitudes towards tele-health, including whether or not they would use it.
Purposes of technology use	The purposes of using technologies (e.g. stay in touch, communicate with providers, etc.).

Preparedness: preventive behaviors and perceptions

Code name	Definition
Understanding of the virus and risk factors of the disease	Knowledge about the virus, including its risk factors and potential preventative approaches.
Risk factors	
Feelings towards COVID-19	Emotional reactions to the current pandemic situation
Influence in daily life	The impact that COVID-19 has caused to the participants and the changes that the participant has made to accommodate the current situation.
Mask wearing	Participants talks about themselves wearing a mask or considering whether to wear a mask.
Grocery shopping	Changes to routines while grocery shopping.
Taking supplements	Taking supplements.
Social distancing	Reduction or elimination of physical contact with others.
Exercise	Change in/to physical activity.
Food stocking	Person stocks up on food.
Hand washing/sanitizing	Heightened attention to hand washing/sanitizing.
trip and activity cancellations	Cancelation of trips, activities, and other plans.
Other	Any preventive behaviors that participants have undertaken that do not fit exclusively in one of the above categories. (This category will be everything that is under the parent category.)
Sense of preparedness	The extent to which participants feel prepared to deal with the situation.
Factors affecting sense of preparedness	The factors affecting a participant's feeling of preparedness to deal with COVID-19.
Sense of responsibility	The poster expresses concern for people and society and opinions about how one should contribute/be responsible. This can include expressing concern as a member of the community and/or stating ways one can support the community (e.g., information sharing, taking care of others, conveying a message* towards the public).

Outlook on the future

Code name	Definition
Optimistic	Expressing hope of overcoming the pandemic
Pessimistic	Expressing worries or concern related to the pandemic or one's health

Social isolation, Social support and Social connectedness

Social distancing and social isolation can be related in the sense that the feeling of being isolated is often the result of social distancing (avoiding physical contact). They can be overlapping when a passage refers to both social distancing, and the phenomenon of feeling isolated as a result of social distancing.

Code name	Definition
Social isolation	States feeling socially isolated and/or describing factors contributing to it.
Social connectedness	States maintaining social connectedness through the use of technology
Social support	Offering instrumental, financial, and emotional support or speaking of offline forms of instrumental, financial, and emotional support.

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