




Full length article

## Navigating online misinformation: Understanding older adults' information-seeking behavior in health crises

Amira Ghenai<sup>a</sup> , Xiaoning Wang<sup>b</sup>, Karyn Moffatt<sup>b</sup><sup>a</sup> Toronto Metropolitan University, 350 Victoria St, Toronto, M5B 2K3, Ontario, Canada<sup>b</sup> McGill University, 845 Sherbrooke St W, Montreal, H3A 0G4, Quebec, Canada

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## ABSTRACT

Older adults face unique challenges in navigating online misinformation, particularly when seeking credible information in digital environments during a crisis event such as a global pandemic. Our study surveyed 210 older adults to explore challenges, usage patterns, exposure to misinformation, and the effectiveness of online platforms' crisis mitigation features. Participants were recruited via an online Qualtrics panel, so our sample reflects older adults who are already digitally engaged. Using the COVID-19 pandemic as a case study, we found that external factors, such as social interaction restrictions (58.71%) and business closures (11.94%), affected information access. Contrary to assumptions, 80% did not need new online tools due to pre-existing digital literacy. Many relied on online resources for updates, with high trust in news/government websites and low trust in partisan sites/social media. On average, participants correctly identified less than half of the presented statements, with most mistakes occurring on misinformation. However, their higher discernment score indicates they more accurately recognized true, personally relevant information than false claims. Our findings advance current understanding by quantifying the diversity in digital adaptation and verification strategies among older adults and identify specific gaps for targeted intervention. This work highlights the need for more visible, accessible verification tools and crisis communication strategies tailored to older adults' distinct needs as their engagement with digital platforms continues to grow across information-seeking contexts.

## 1. Introduction

The rapid growth of digital technologies has transformed how people access, share, and process information. While this digital shift offers unprecedented access to knowledge, it has also facilitated the widespread dissemination of misinformation—that is, false or misleading content that can have significant societal consequences (Ahmed et al., 2022; Del Vicario et al., 2016; Olan et al., 2024). Misinformation spans various domains, including politics (Jerit & Zhao, 2020), health (Nascimento et al., 2022), science (Cacciatore, 2021), and social issues (Broda & Strömbäck, 2024), posing challenges to individuals' ability to make informed decisions. Among the populations affected, older adults (aged 60 years and older) represent a particularly important demographic to study due to their increasing reliance on digital platforms for information and unique vulnerabilities in navigating online environments (Mentis et al., 2019; Murthy et al., 2021; Xiang et al., 2020; Yang et al., 2024; Zhou et al., 2023). Much of our current understanding is based on earlier cohorts of older adults who had lower levels of technology use, resulting in expectations often shaped by outdated research and persistent stereotypes. As digital engagement

among older adults continues to evolve, there is a pressing need to revisit these assumptions and develop a more accurate understanding of their experiences and needs.

Research suggests that older adults may face distinct challenges when engaging with online information, such as difficulties in verifying content credibility, navigating complex digital interfaces, and managing information overload (Brashier & Schacter, 2020; Hargittai et al., 2019; Van Deursen & Van Dijk, 2011; Verma et al., 2022). Some studies have linked these challenges to age-related cognitive changes that can influence the ability to discern true from false information (Allcott & Gentzkow, 2017; Guess et al., 2019; Hess et al., 2016; Moore & Hancock, 2022; Pennycook et al., 2018). However, framing older adults solely as passive recipients of misinformation risks perpetuating ageist stereotypes, overlooking their digital resilience, critical thinking skills, and diverse online behaviors (Guess et al., 2019; Knowles et al., 2021; Moore & Hancock, 2022). Despite the growing body of research on misinformation, most studies have focused on political misinformation (Brashier & Schacter, 2020; Buchanan, 2020), with limited attention to health-related misinformation, which can

\* Corresponding author.

E-mail address: [aghenai@torontomu.ca](mailto:aghenai@torontomu.ca) (A. Ghenai).<https://doi.org/10.1016/j.chbr.2026.101033>

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have more immediate and severe consequences for well-being (Sun et al., 2020; Verma et al., 2022). Moreover, existing studies often treat older adults as a homogeneous group, ignoring the wide variability in digital literacy, cognitive abilities, and online engagement within this population (Roozenbeek et al., 2020; Vivion et al., 2024).

In this study, we aim to fill these gaps by exploring older adults' interaction with online health misinformation, using the COVID-19 pandemic as a case study. Importantly, our data were collected in January 2021, during an active phase of the pandemic when social restrictions and uncertainty were ongoing, allowing us to observe information-seeking and verification behaviors in real time rather than through retrospective recall. The pandemic provided a unique context to examine how older adults sought health-related information, encountered misinformation, and navigated online platforms designed to combat false content. Because participants were recruited via an online Qualtrics panel, our sample reflects older adults who are already digitally engaged, complementing prior work that has focused more on digitally excluded groups. Our research seeks to identify the challenges older adults face in online information-seeking, measure their ability to correctly identify and discern health misinformation, and assess the effectiveness of platform-based interventions intended to mitigate misinformation. Through this study, we aim to contribute to a more nuanced understanding of older adults' digital experiences, moving beyond deficit-based narratives to highlight both their vulnerabilities and strengths in the context of online misinformation. Notably, this is one of the first studies to assess older adults' ability to accurately recognize and discern misinformation, and to evaluate their awareness and use of online platform-based mitigation tools during a public health crisis. To guide our investigation, we address the following research questions:

- **RQ1:** What contextual and technological challenges did older adults face in seeking information amid the shift to virtual and online services?
- **RQ2:** How did older adults use online resources to find health-related information, and what levels of trust did they place in various sources and specific types of information?
- **RQ3:** How accurately can older adults discern between true and false information encountered online during a health crisis? (*Outcome: Discernment Accuracy*)
- **RQ4:** In relation to this discernment process, what strategies do older adults use to verify online information, how do they respond when encountering misinformation, and to what extent are they aware of or engaged with platform-based mitigation tools? (*Process: Verification Behavior*)

Our analysis found that older adults' information-seeking behaviors during the pandemic reflected two interrelated dimensions of challenge—contextual and technological. Contextually, social interaction restrictions significantly limited older adults' traditional in-person channels for obtaining information—such as conversations with family and community members. This constraint (addressed in RQ1) appeared to drive a compensatory shift toward greater reliance on digital sources. At the same time, the technological dimension of RQ1 revealed that most participants were able to navigate these online environments effectively: 80% of participants did not need to learn new tools, reflecting high pre-existing digital literacy that facilitated continued information access despite social restrictions. Usability of online resources was moderate ( $SUS \approx 66$ ), suggesting that technology access was less of a barrier than often assumed.

When searching for information (RQ2), older adults appreciated the convenience of online sources, but prioritized reliability, most frequently seeking case statistics and policy updates from trusted news and government websites, while expressing low trust in partisan or social media. However, they rarely consulted academic sources—possibly reflecting less familiarity or confidence with these materials. This pattern

stands in contrast to prior research showing that younger adults more commonly rely on social media and a wide variety of online sources for news (Pew Research Center, 2023a, 2023b), while earlier studies have emphasized older adults' preference for traditional print and television media (Zhu & Chen, 2016). Our findings suggest that, at least within this digitally engaged sample, older adults have shifted much of their information-seeking to online government and news sources, marking a notable evolution from earlier generations' reliance on print and broadcast media.

Participants demonstrated a higher ability to discern true from false information (discernment accuracy) (discernment score 0.553 vs. correctness 0.458), particularly among those with more frequent online use, higher usability ratings, and greater self-perceived knowledge (RQ3). Building on this discernment process, older adults engaged in various verification and response behaviors, relying on trusted sources (87%), top-ranked search results (41%), and checking multiple sites (39%). However, over half simply ignored misinformation, and only 21% expressed blanket trust in online content. Awareness and use of platform-based mitigation tools was generally low.

This study delivers a comprehensive, empirically grounded analysis of older adults' information-seeking behaviors and their ability to accurately recognize and discern misinformation in online content related to a major health crisis, leveraging a large, representative sample. Unlike much of the prior work that has either relied on perceptions or focused on algorithmic interventions (Choudrie et al., 2021; Ghenai et al., 2023), our research quantitatively establishes that while older adults generally exhibit strong digital adaptation and a preference for cautious verification, they nonetheless face persistent gaps in the awareness and usage of platform-based mitigation tools (Grinberg et al., 2019; Guess et al., 2019), as well as in distinguishing sophisticated misinformation (Swire-Thompson et al., 2020; Vivion et al., 2024).

Methodologically, we introduce a dual-metric assessment—correctness and discernment scores—that advances the evaluation of information resilience by distinguishing between general knowledge and nuanced detection of falsehoods, surpassing previous approaches that often conflated these concepts (Pennycook et al., 2020; Vivion et al., 2024).

The practical implications of these findings are substantial: interventions for older adults should prioritize enhancing awareness and usability of verification tools, reinforce protective cautious behaviors (Ghenai et al., 2023), and tailor support for those with lower digital confidence or facing rapid information shifts in crisis contexts (Choudrie et al., 2021; Hargittai et al., 2019). By exposing the heterogeneity within the older adult population (Ghenai et al., 2023; Neves et al., 2018), our results call for adaptive and context-sensitive design of digital health and crisis communication tools, rather than generic digital literacy approaches.

**Organization.** In Section 2, we review existing literature, contextualizing our study within the broader field of misinformation and information-seeking behavior among older adults. Section 3 details the research design, data collection procedures, and analytical approaches used in our study. Section 4 presents the results of our data analysis, highlighting key insights and patterns observed. Finally, Section 6 acknowledges the study's limitations, suggests areas for future research, and concludes with a summary of the main contributions and outcomes of our study. We also include supplementary materials that provide additional detailed information relevant to our study (refer to Appendix A. Supplementary data).

## 2. Background and related work

Prior work has examined how older adults adopt technology, seek information online, and navigate digital environments, often focusing on trust, digital literacy, and barriers to engagement. Research has also addressed challenges related to misinformation and evaluated interventions to support older adults during public health crises. However, gaps remain in understanding how these factors interact and shape digital engagement—especially during times of heightened uncertainty or rapid change.

## 2.1. Technology adoption among older adults

Research has consistently found a difference in technology adoption, where older adults are less engaged with digital tools compared to younger generations (Sin et al., 2021). This difference often includes variations in digital literacy and experience, not just a binary divide between users and non-users. However, recent critiques have underscored that older adults are increasingly adopting technology and becoming prominent Internet users, challenging the traditional notion of a “grey digital divide” (Hunsaker & Hargittai, 2018; Neves et al., 2018). Although older adults are increasingly adopting technology, significant differences in usage and skill levels remain, especially among the oldest age groups (Center, 2014; Friemel, 2016; Hunsaker & Hargittai, 2018). For instance, despite improvements in digital literacy, many older adults still depend on others for setting up and learning new technologies (Pang et al., 2021; Vroman et al., 2015).

A large body of research has focused on increasing digital access for older adults to address the grey divide. Many researchers have specifically looked at the accessibility requirements for individuals with age-related impairments, such as vision loss (Brewer, 2016; Brewer & Piper, 2017; Chiu et al., 2023; Kim, 2021; Piper et al., 2017; Taieb-Maimon & Vaisman-Fairstein, 2022), cognitive decline (Chin & Fu, 2012; Hollinworth & Hwang, 2011; Kim et al., 2011), memory loss (Sharit et al., 2008), and dementia (Johnson et al., 2019). Another line of work has targeted the broader older adult population, focusing on improving online resources to overcome digital literacy barriers (Coleman et al., 2010; Steelman et al., 2016).

In addition to addressing perceived digital disparities, an increasing body of research highlights the diverse needs, opinions, and preferences of older adults regarding technology adoption, including their skepticism toward technology. This skepticism, often seen as a major barrier to adopting online sources (Knowles & Hanson, 2018; Zafrani et al., 2023; Zulman et al., 2011), reflects a prudent approach to perceived risks and a lack of confidence in using these technologies safely. Many older adults tend to trust physical interactions more than digital sources and feel more comfortable obtaining information from trusted individuals rather than static, non-interactive online sources (Vivion et al., 2024). This distrust is not merely a hurdle to be overcome but a reflection of older adults’ wisdom and caution. Thus, the challenge lies not in making older adults trust digital technology more readily but in making these technologies more worthy of their trust. Interestingly, despite these concerns, some older adults still find online sources convenient for seeking information (Knowles & Hanson, 2018; Mayer et al., 2023), indicating that enhancing the trustworthiness of digital platforms could significantly improve their adoption and use.

Recent research has critiqued the traditional “grey digital divide”, emphasizing the diversity in older adults’ digital skills and technology use. Studies have identified barriers to online engagement as well as factors that support digital confidence and ease of use within this group.

## 2.2. Misinformation challenges and solutions for older adults

Many older adults may experience more difficulty in discerning the accuracy of online information compared to younger generations (Allcott & Gentzkow, 2017; Grinberg et al., 2019; Guess et al., 2019), although these difficulties can vary widely depending on factors such as individual digital literacy, prior experience with technology, and access to reliable resources. This issue is particularly relevant in the context of misinformation, which includes a variety of types such as health misinformation, political misinformation, fraudulent schemes, and conspiracy theories.

Health misinformation, for instance, can mislead individuals about treatments, vaccines, or public health measures, disproportionately affecting older adults due to its prevalence on platforms they trust. For example, Choudrie et al. (2021) found that during the COVID-19 pandemic, older adults often relied on familiar sources, which

sometimes led to the acceptance of false claims when they struggled to identify credible information. This vulnerability is further influenced by age-related immune changes and underlying health conditions, making some older adults more susceptible to misinformation. During the pandemic, such misinformation significantly contributed to vaccine hesitancy, posing risks to their health and well-being (Bloom et al., 2024; Hsieh et al., 2022; Wu & Brennan-Ing, 2023). However, other research, including large-scale surveys and interviews, suggests that older adults may, in some cases, exhibit lower susceptibility to health misinformation, demonstrating a stronger ability to recognize false information (Roozenbeek et al., 2020; Ross et al., 2014; Vivion et al., 2024).

Political misinformation, on the other hand, often manipulates opinions or stokes division, with Guess et al. (2019) showing that many older adults are more likely to share political misinformation on social media compared to younger demographics. This behavior was linked to differences in media consumption habits and trust in online sources. Expanding on this, Grinberg et al. (2019) found that while some older adults accounted for a relatively small portion of overall social media users, they were disproportionately responsible for sharing fake news during the 2016 U.S. presidential election. The study attributed this pattern to older adults’ higher trust in partisan sources and lower engagement with diverse perspectives online. However, other research suggests that older adults’ accumulated knowledge and experience may enhance their ability to evaluate information accuracy. For instance, Allcott and Gentzkow (2017) found that older adults were better at distinguishing true headlines from false ones after the 2016 U.S. presidential election. Similarly, Pennycook and Rand (2019) observed that older adults outperformed younger individuals in identifying fake headlines compared to real ones with discernment improving with age across two experiments.

Older adults may also be targeted by scams, such as phishing attempts or fraudulent health products, exploiting their trust in specific platforms or perceived vulnerabilities (Grinberg et al., 2019; Vivion et al., 2024). Amini et al. (2022) investigated how older adults respond to phishing scams, revealing that unfamiliarity with digital safety practices increases their vulnerability.

The widespread dissemination of misinformation during crises can have severe societal consequences. For instance, misinformation can endanger public health, particularly by spreading false or misleading health-related claims (Ali, 2022). It can also undermine the credibility of authoritative organizations and public institutions, eroding trust in official information sources (Swire-Thompson et al., 2020). Additionally, misinformation has been linked to triggering negative social movements and fueling societal divisions, contributing to various forms of violence and discrimination (Gallotti et al., 2020). For some older adults, misinformation can lead to heightened confusion, anxiety, and mistrust of digital platforms (Radwan et al., 2020; Vivion et al., 2024). In particular, some older adults may focus more on the factual content presented and less on contextual web features such as design, source identity, and user-generated comments, making them susceptible to well-crafted misinformation (Liao & Fu, 2014).

The effects of misinformation extend beyond individual confusion, influencing social relationships and digital behaviors. Exposure to misinformation can lead to emotional distress, conflicts with friends and family, and reduced engagement with online platforms (Jiang et al., 2021; Vivion et al., 2024). To cope with misinformation, older adults may adopt various strategies. Some avoid social media altogether to reduce exposure to misleading content (Soroya et al., 2021). Others choose to block or unfollow sources that frequently share misinformation as a proactive filtering approach (Howell et al., 2014). Additionally, many older adults rely primarily on trusted websites and familiar sources, reinforcing selective information consumption patterns (Choudrie et al., 2021; Vivion et al., 2024). However, these strategies can also limit their access to diverse information and reduce opportunities for digital engagement.

To reduce the spread of misinformation, social media during the COVID-19 pandemic employed various approaches to check the accuracy of information on their sites. For instance, Facebook uses artificial intelligence, keyword searches, and independent third-party fact-checkers to check information within the platform (Facebook, 2021), while YouTube combines feedback from human evaluators and machine learning systems to identify videos with misinformation (YouTube, 2021). Most of these fact-checking features are presented to users in the form of alerts that tag posts or videos with possible misinformation (Thorbecke, 2020). Some of the current research suggests that these fact-checking features are effective in improving users' perceptions of information accuracy (Nyhan et al., 2020; York et al., 2020). However, these fact-checking features do not have a significant impact on improving users' perceptions of trustworthiness, though their presence does seem to improve people's judgment of the overall quality of the site (Oeldorf-Hirsch et al., 2020).

Prior research consistently demonstrates that many older adults rely on familiar and trusted information sources, such as news and government websites, and tend to place less trust in partisan sites and social media (Allcott & Gentzkow, 2017; Choudrie et al., 2021; Pennycook & Rand, 2019). However, most studies have focused on perceived trust rather than directly measuring actual exposure to or discernment of misinformation in this demographic. Furthermore, there is limited evidence on how older adults interact with platform-based misinformation mitigation initiatives, such as fact-checking alerts and credibility tags, during health crises.

### 2.3. Information-seeking behavior of older adults during public health crises

Health crises can significantly reshape how individuals seek and process information, particularly among older adults who may face unique challenges in navigating digital environments. During global health emergencies, older adults often increase their reliance on online platforms for information; however, their ability to effectively engage with these resources is influenced by multiple factors, including digital literacy and trust in sources (Sin et al., 2021). Accessibility barriers, such as difficulties in navigating complex interfaces or understanding evolving digital tools, can also impact their online information-seeking behavior (Cheng et al., 2023). Additionally, age-related mobility, sensory, and cognitive limitations may further affect their ability to verify and interpret online content, making them more vulnerable to misinformation or unreliable sources (Ngo, 2001; Zhao et al., 2022).

The transition to digital platforms during public health crises has heightened the challenges some older adults face in seeking and evaluating information online. Prior work has documented that, while many older adults use digital tools, increased dependence on these platforms during emergencies can intensify difficulties in identifying credible sources and adapting to rapidly changing digital environments. Despite this, there remains limited understanding of how older adults navigate information credibility and verification during periods of intensified digital reliance.

Widespread crises can have a devastating impact on human life. For older adults, in certain contexts, pandemics often reduce access to traditional sources of information such as newspapers, libraries, and community centers (Mushtaq & Khan, 2024; Radwan et al., 2020). Although many older adults have already adopted digital technologies for certain tasks, the sudden almost exclusive reliance on digital alternatives may have posed challenges due to varying levels of digital literacy among them. During past mass emergencies, many older adults found it difficult to navigate the complex and often cluttered digital landscape, leading to frustration and misinformation exposure (Zhang et al., 2020).

Beyond the shift in access to information, the need to learn new tools and technologies posed a significant challenge for people who are unable to access technology during that time. To mitigate the negative impact of lockdown restrictions, various virtual alternatives

were introduced, such as digital social events, online fitness classes, and online mental health services (Sin et al., 2021; Yang et al., 2020). For instance, prior studies have highlighted that crisis technologies can facilitate stronger connections between older adults, organizations, and family members, reducing social isolation (Apuke & Tunca, 2018). Additionally, these technologies play a crucial role in keeping older adults informed about local epidemic-related emergency warnings and improving their personal preparedness (Knox, 2023). While these solutions offer potential benefits, many older adults experiencing social and digital exclusion may face challenges that limit their ability to fully engage with these technologies (Friemel, 2016; Neves et al., 2013). For some, barriers such as digital literacy gaps, lack of access to internet-enabled devices, and unfamiliarity with online services can hinder adoption (Beaunoyer et al., 2020; Zhang et al., 2020). Additionally, disparities in technological access within assisted living or lower-income communities further contribute to the digital divide, affecting certain older adults more than others (Seifert et al., 2021).

Recent work by Settels and Bertogg (2025) found that pandemic driven online information-seeking among older adults had mixed effects on well-being, with government information searches linked to higher depressive mood. The impact was strongest for those with limited offline ties, highlighting how digital engagement can both mitigate and exacerbate loneliness during crises.

Therefore, while prior research has highlighted both the benefits and barriers of digital engagement for older adults, our study focuses on how this demographic navigates, evaluates, and utilizes online resources during crisis situations. By using the COVID-19 pandemic as a case study, we specifically examine the influence of crisis-driven digital interventions on older adults' access to and trust in reliable information.

### 2.4. The digital-engagement gap

Much existing accessibility and human-computer interaction (HCI) research has used qualitative and quantitative methods to explore the challenges older adults face when using digital platforms, focusing primarily on usability and interface design. For instance, Sin et al. (2021) found that older adults utilized digital tools to maintain social connections but also encountered barriers related to usability and digital literacy. Vivion et al. (2024) found that older adults employed various strategies, such as ignoring unreliable sources and seeking information from trusted individuals, to navigate the overwhelming amount of information. Further, Cheng et al. (2023)'s research indicated that trust in online sources was influenced by previous experiences, the perceived credibility of the information, and the complexity of digital tools, which often hindered older adults' effective use of online platforms.

On the other hand, research in other domains, such as user-centered design and inclusive technology, has examined broader aspects of technology use among older adults, including their cognitive and social interactions with digital tools. For instance, research in user-centered design highlights the importance of directly involving older adults in the design process to ensure that digital technologies align with their needs and preferences (Lindsay et al., 2012). Some studies have explored how interactive and adaptive digital interfaces can support older adults' engagement with online platforms, addressing usability concerns and accessibility barriers (Jin et al., 2024). Additionally, research in assistive and inclusive technology has examined how personalized support features and learning-based interventions can enhance digital literacy and confidence among older users (Yang, 2023). This approach challenges assumptions that portray older adults primarily through a lens of physical and cognitive decline, diminished societal relevance, and limited inclusion in the digital world.

Overall, there is a notable lack of comprehensive assessments of how older adults navigated online resources during the pandemic and how they dealt with the influx of misinformation. Similarly, while some research has touched on the psychological impact of misinformation on

older adults, it has not thoroughly explored the extent of their exposure or their strategies for verifying information.

Our work reveals another side of older adults that is often underrepresented in research, highlighting their resilience and adaptability. By conducting a detailed survey, we contribute to the literature by understanding the online information-seeking behavior of older adults during a global pandemic and providing empirical measures of their exposure to misinformation. The findings showcase their ability to adapt and manage digital tools effectively despite the challenges, offering a more nuanced view of their digital engagement and capabilities.

### 3. Methods

#### 3.1. Method: Survey

We adopted a quantitative survey methodology to systematically capture patterns at scale among older adults. This approach allows us to quantify the prevalence of misinformation exposure, discernment performance, and verification strategies across a relatively large, stratified sample, providing population-level estimates that are more generalizable than those typically obtained from small qualitative studies.

##### 3.1.1. Survey design

The online survey consisted of six main sections: (1) informed consent, (2) demographic information, (3) definitions of COVID-19 and the coronavirus (to make sure all participants have the minimum knowledge to effectively conduct the survey) followed by challenges older adults are facing while conducting information seeking during the COVID-19, (4) usage of online resources to get information about COVID-19, (5) measuring participants' knowledge about general COVID-19 statements and how much they are exposed to misinformation, followed by methods and techniques for evaluating the correctness of COVID-19 information, and (6) the effectiveness of fact-checking efforts adopted by online platforms to fight COVID-19 misinformation spread. At the end of the survey, (7) we list all COVID-19 statements asked about in section five with their corresponding correct credibility judgments with a 'print' option to enable participants to print this information and keep it for their records. To ensure that the truth values used in section five accurately reflected the scientific consensus at that specific period, all statements were verified against authoritative health agencies active at that time, including the World Health Organization (WHO) and the Public Health Agency of Canada (PHAC). The verified list of statements and corresponding truth values is provided in the Debrief section of Appendix A (Supplementary data).

We adopted a quantitative survey design to systematically capture patterns at scale. This approach allows us to quantify the prevalence of misinformation exposure, discernment performance, and verification strategies across a relatively large, stratified sample of older adults, providing more generalizable estimates than small qualitative studies, while complementing prior interview-based work in this area.

The survey was conducted on January 2021 and took a total of 25 to 30 min to be completed (see Appendix A (Supplementary data) for the complete survey instrument). The survey instrument was tested with colleagues and students from our research labs, who were not involved in the project.

This study was reviewed and approved by the [ANONYMIZED UNIVERSITY] Research Ethics Board (Protocol #XXXX). All participants provided informed consent prior to participation, in accordance with institutional and national research ethics guidelines. Participation was voluntary, and respondents were informed that they could withdraw at any time without consequence. The online survey included a consent form outlining the purpose of the study, confidentiality measures, and data-sharing options (see Appendix A (Supplementary data) for the complete consent text).

##### 3.1.2. Recruitment

Data for this study were collected through an online survey (N = 210), during the month of January 2021, during the second major wave of the COVID-19 pandemic in Canada. At that time, public health restrictions were in effect nationwide, including limitations on social gatherings, widespread business and service closures, and the early rollout of vaccination programs for priority groups. Further, collecting responses at this stage of the pandemic means the survey captures in-the-moment behaviors and decisions under actual crisis conditions, rather than relying on retrospective accounts that may be affected by memory bias.

Participants were selected from online panels recruited by Qualtrics (Software, 2020). This platform has been deployed in several previous user studies and survey-based research in different domains (Bomfim et al., 2023; Cho et al., 2018, 2020; Smith et al., 2020). The panel is an opt in, privacy-protected participant pool that consists of millions of panelist members over the world. Eligibility was restricted on age (must be 60 years of age or older), language (must be able to participate in English), and location (must be residing in Canada). Only older adults capable of completing an online survey (independently or with help) were able to participate. This is consistent with the demographic of individuals we targeted in this study. Qualtrics panel members that meet the recruitment criteria were sent an email invitation or prompted on the respective survey platform to open a hyperlink that would take them to the survey page. As incentives to participate in the survey, all respondents who recorded their e-mail address had the option of being entered into a draw to win \$75 with the odds of winning no less than 1 in 25.

Stratified random sampling was adopted based on the panel members' age and gender. The sample size of each stratum was proportionate to the population size. Population estimates were collected from the official government website of Statistics Canada (Canada, 2020), reflecting the demographic profile of the Canadian older adult population (aged 60 and above) rather than the general population. Specifically, the gender distribution was designed to reflect the targeted population, with 47% male and 53% female participants, rather than an equal 50/50 split. Additionally, the age distribution of participants was aligned with national demographics: 27% aged 60–64, 23% aged 65–69, 19% aged 70–74, 13% aged 75–79, 9% aged 80–84, and 9% aged 85 and above. This was applied to provide a better representative sample of the overall population of older adults in Canada. After a careful examination of the study data from the 210 participants, we did not find any irregularities and thus did not clean or modify the data before analysis.

Participants were recruited through Qualtrics online panels, which allowed for demographic balancing across gender and age groups in accordance with Canadian census data. However, because participation required internet access and familiarity with online survey platforms, the sample is likely to overrepresent older adults who are already comfortable using digital technologies. Consequently, the overall digital literacy and usability levels observed in this dataset may be somewhat higher than those found in the general older adult population.

##### 3.1.3. Quantitative analysis

We performed correlation analysis to address RQ1, RQ2, and RQ3. Specifically, we utilized Pearson's chi-squared test for of categorical data and ANOVA for continuous data to evaluate how likely it is that any observed differences arose by chance (Cohen, 2013). We also utilized Cramer's V as a measure of the strength of the association between variables (effect size) (Cohen, 2013). For RQ4, we presented the frequency counts of questions relevant to this research question.

Additionally, for RQ3, we conducted regression analysis to identify influential factors regarding participants' ability to answer COVID-19-related questions correctly as implemented in R (R Core Team et al., 2013) and the lme4 (Bates et al., 2015) package. We employed

mixed effect regression, where random effects accounted for participant (at the individual level) and question (at the group level). Our independent and explanatory variables were treated as fixed effects. Next, we utilized a normal linear regression model, as implemented in R (R Core Team et al., 2013) and the `lm` (Lüdtke et al., 2021) package, to analyze the factors impacting participants' ability to correctly identify and distinguish between true information and false information (misinformation).

Further, we adopted a hierarchical modeling approach, where each independent and explanatory variable's effect on our dependent variables was tested individually. To assess the significance of these variables, we constructed and compared two models using a likelihood ratio test, yielding a Chi-Square test statistic and *p*-value. The complete model included the dependent variable, relevant independent variables, and random effects, while the null model excluded the variable of interest. By comparing the two models, we performed the likelihood ratio test, and *p*-values were obtained through chi-square tests on the log-likelihood values.

Two key dependent variables were analyzed: the correctness score and the discernment score. The correctness score represents the fraction of correct decisions (Pogacar et al., 2017). A participant's decision about a statement is considered correct if it matches the truth (Refer to the Debrief section in the Appendix A (Supplementary data) for the complete list of statements and their truth values). Note that if a participant answers a statement's correctness as inconclusive, this decision will always be incorrect, as all statements are definitively categorized as either correct or incorrect.

This approach follows established methodologies in misinformation research (Pogacar et al., 2017), where inconclusive responses are treated as incorrect to maintain consistency and accuracy in scoring. Further, while cautious responses may reflect a reasonable strategy in some contexts, in others, they may lead to significant risks. For example, in health-related decision-making, an inconclusive response to the effectiveness of a treatment could leave individuals vulnerable to harmful decisions, such as stopping or starting a medication based on uncertain information. Thus, treating inconclusive responses as incorrect in this study reflects real-world scenarios where uncertainty can have serious consequences.

The discernment score, in contrast, measures how well individuals can distinguish factual accuracy (true statements) from misinformation (false statements or rumors). This measure, known in the literature as the Discernment Score (Pennycook et al., 2020), quantifies one's ability to correctly identifying true statements compared to incorrectly identifying false statements. Specifically, the Discernment Score is calculated as the difference between the proportion of true statements correctly identified and the proportion of false statements incorrectly identified. The Discrimination Score is equal to:

$$\left( \frac{\text{True statements correctly identified}}{\text{Total number of true statements}} \right) - \left( \frac{\text{False statements incorrectly identified}}{\text{Total number of false statements}} \right)$$

where a positive discernment score indicates that the participant is more sensitive to true information, meaning they are more likely to correctly identify true statements than to incorrectly identify false ones. Note that the discernment Score is calculated here based on the ability to distinguish between true and false responses, where "inconclusive" answers are excluded to focus on participants' ability to make definitive judgments. This approach ensures the discernment score reflects participants' confidence and accuracy without conflating caution with correctness, offering a clearer picture of their ability to differentiate between true and false information.

In this study, we computed two complementary measures of information evaluation accuracy to capture both general correctness and discriminative ability. The Correctness Score was calculated based on all responses, treating "inconclusive" answers—defined as "I have

heard about this before and I am uncertain whether it is true or false" or "I have never heard about this before" as incorrect, following prior misinformation research that operationalizes accuracy as the ability to correctly classify statements as true or false (Pogacar et al., 2017). This approach reflects real-world decision-making contexts where uncertainty can have practical implications for behavior. To account for conceptual distinctions between indecision and misclassification, we also computed a Discernment Score, which excludes inconclusive responses to assess participants' ability to distinguish between true and false statements.

### 3.2. Samples

#### 3.2.1. Survey participants

Participants were approximately evenly distributed between those who identified as male (46.7%) and those who identified as female (53.3%), with ages ranging from 60 to 86 (standard deviation was 6.8 and the mean was 70.42). All participants were sufficiently proficient in English to complete the survey, with the majority (96.2%) being fluent. They lived in independent residences (95.2%), resided alone (31.9%), or with one (40.5%) or two (20%) other individuals. This suggests that our study largely reflects the experiences of independently living older adults, with limited representation from those in assisted living environments. Most of the participants completed post-secondary or greater levels of education (71.3%) and were retired (76.6%). Nationally, approximately 30% of Canadians aged 15 and older hold a university degree, and about two-thirds have completed some form of post-secondary education (Statistics Canada, 2021). While our sample reflects a somewhat higher level of educational attainment than national averages, this pattern is consistent with prior research indicating that online survey samples, particularly among older adults, tend to overrepresent individuals with higher education and stronger digital literacy skills.

As an indirect measure of income, participants were asked, "Suppose you have found an advertisement for a new tablet computer priced at \$1000 and that you decided you would like to own one. What would you be willing to do in this scenario?" as included in Appendix A (Supplementary data) survey instrument (Demographics and Health-Related Questions, Question (7)). Only 44.3% stated they would go to the store and buy the tablet. Table 1 summarizes the participants' demographics.

In addition to the demographic data, we asked general questions about participants' well-being, specifically focusing on five categories: Sensory, Physical, Cognitive, and Mental Health (Grondin, 2016). The data revealed overall positive health conditions, with a significant proportion reporting no difficulty in vision (42.9%), physical activities (43.3%), and robust cognitive health (53.8%). Emotional and mental well-being is also relatively favorable, as 71.9% reported never experiencing related issues. While variations exist in reported chronic conditions, ranging from 46.2% reporting none to 21.4% reporting always, the general trend suggests a good state of health among participants. The recruited population of older adults exhibits a favorable health profile and overall well-being.

#### 3.2.2. Limitations

Our sample is diverse in terms of age, gender, and education levels, which strengthens the relevance of our findings. However, recruiting participants through platforms like Qualtrics may have introduced selection bias and other biases inherent to online panel recruitment (Miller et al., 2020; Ogletree & Katz, 2021). Given that this study was conducted during the COVID-19 pandemic, in-person interviews were not feasible, further limiting the recruitment options. These factors may limit the generalizability of the sample. Additionally, due to COVID-19 restrictions and regulations being varied significantly by geographic location, our recruitment was limited to participants living in Canada. In the future, we plan to conduct similar studies with

a broader geographic distribution to enhance the generalizability of our findings.

Second, the study is geographically restricted to Canada. Canadian pandemic policies (e.g., publicly communicated federal and provincial guidelines), a publicly funded healthcare system, and relatively high levels of broadband access and digital government services shape how older adults access and evaluate online health information. As a result, our findings may not fully generalize to countries with different health systems, weaker digital infrastructure, or more fragmented public communication. The patterns we observe should therefore be interpreted as reflecting a Canadian context, and future work is needed to examine whether similar discernment and verification behaviors emerge in other national settings.

In addition, our reliance on a quantitative survey design entails important methodological trade-offs. While the survey allowed us to quantify the prevalence of misinformation exposure, discernment performance, and verification strategies across a relatively large, stratified sample of older adults, it does not capture the full nuance of how participants reason through specific pieces of information, negotiate conflicting cues, or make decisions in context. Richer, process-oriented phenomena — such as how people move between sources in real time, how they discuss content with family or peers, or how emotional responses shape their judgments — are better suited to qualitative methods such as in-depth interviews, think-aloud protocols, or digital ethnography. Although in-person interviews were not feasible during the pandemic, remote qualitative approaches (e.g., video interviews or online observation) could complement survey-based findings in future work by deepening our understanding of the mechanisms underlying the patterns we report here.

Furthermore, our measures rely on self-reported behaviors and perceptions, which introduces potential self-report and social desirability bias. Participants may overstate desirable practices (e.g., verifying information, relying on trusted sources) and underreport less desirable ones (e.g., ignoring misinformation or using lower-quality sources), and SUS scores capture perceived rather than directly observed usability. As a result, the true prevalence of some behaviors may differ from what is reported here, and future work using behavioral or observational data could help validate and extend these findings.

Another notable limitation of this study is the inclusion of only one participant residing in a care facility, compared to the majority who lived independently. Older adults in assisted living settings often have distinct patterns of digital engagement and information-seeking behavior due to their reliance on mediated information through caregivers and the availability of on-site health care providers (Garnett et al., 2024; Lemaire et al., 2023; Racin et al., 2023). As a result, their needs and behaviors in accessing online content differ significantly from those living independently. Including a more balanced sample might not have necessarily strengthened the findings, as the goals and challenges faced by these populations are inherently different. Future studies should consider focusing separately on the unique experiences of older adults in assisted living environments to gain a clearer understanding of how factors such as caregiver mediation and physical or cognitive impairments influence their interaction with online resources and exposure to misinformation.

Finally, while the use of Qualtrics ensured a broad demographic reach and efficient data collection during the pandemic, this recruitment approach inherently limits participation to individuals who are already digitally engaged. All participants had sufficient internet access and skills to complete an online survey. In contrast, national data from the Canadian Internet Use Survey indicate that in 2022 roughly 82% of Canadians aged 65 years and older used the Internet, with usage dropping to about three-quarters among those aged 75 and older, and that a substantial share of seniors are classified as non-users or only basic users of digital technologies (Statistics Canada, 2023a, 2023b; Wavrock et al., 2021). Compared with this broader population, our sample likely overrepresents more active and confident internet users. As a result, our findings probably reflect the experiences of digitally active older adults and may modestly underestimate the challenges faced by more digitally excluded groups.

**Table 1**  
Summary of participants' demographics (N = 210).

Age		Ability to purchase a tablet (\$1000)	
60–64	58	Able and willing to purchase	93
65–69	49	Interested but unable to purchase	58
70–74	39	Not interested in purchasing	51
75–86	59	Undisclosed	8
Gender		Housing type	
Male	98	Independent home	209
Female	112	Facility	1
Household size		Language	
Alone	67	English	202
1 person	85	French	24
2 people	42	Spanish	3
3 people	9	Chinese	2
4 or more people	7	Other	7
Employment status		Education level	
Retired	161	Less than high school	7
Part-time	24	High school graduate	53
Full-time	18	Post secondary	74
No work/homemaker	7	Bachelor's degree	57
		Master's degree	19

## 4. Findings

### 4.1. RQ1: Challenges during the online/virtual shift

RQ1 examines the challenges older adults faced when seeking information during the pandemic across two interrelated dimensions: contextual and technological. Contextual challenges stemmed from external disruptions; such as social restrictions and changes to daily routines, while technological challenges involved adopting and using online tools that became essential for accessing information. The following subsections present these dimensions sequentially.

#### 4.1.1. Knowledge about COVID-19

Self-assessed knowledge is an important indicator of confidence in information-seeking behavior, influencing how individuals evaluate and trust online sources. At the beginning of the survey, participants were asked to assess their general knowledge of the COVID-19 pandemic relative to their peers as included in Appendix A (Supplementary data) survey instrument (Challenges-Related Questions, Question 1). Nearly half rated their knowledge as “Good” (100, 47.62%), with smaller proportions rating it as “Adequate” (59, 28.10%) or “Excellent” (29, 13.81%). Only a few participants rated their knowledge as “Fair” (20, 9.52%) or “Poor/No Knowledge” (2, 0.96%). Overall, most participants reported having good self-perceived knowledge about the pandemic.

#### 4.1.2. Contextual challenges: Impact of pandemic-related changes

During the COVID-19 pandemic, Canada implemented various public health measures to control the spread of the virus, which significantly affected daily life across the country. Social interaction restrictions were among the most impactful measures, varying in severity depending on the region and pandemic wave. Early restrictions included limits on social gatherings, closure of non-essential businesses, and stay-at-home orders in several provinces (Government of Canada, 2020). Public health guidelines restricted indoor gatherings with anyone outside immediate households, while outdoor gatherings were allowed with strict limits on group size (Public Health Agency of Canada, 2020). Many long-term care facilities suspended in-person visits, contributing to feelings of social isolation among most older adults (Deber et al., 2022). The closure of community centers, places of worship, and recreational facilities further limited opportunities for social engagement. As the situation evolved, some restrictions were

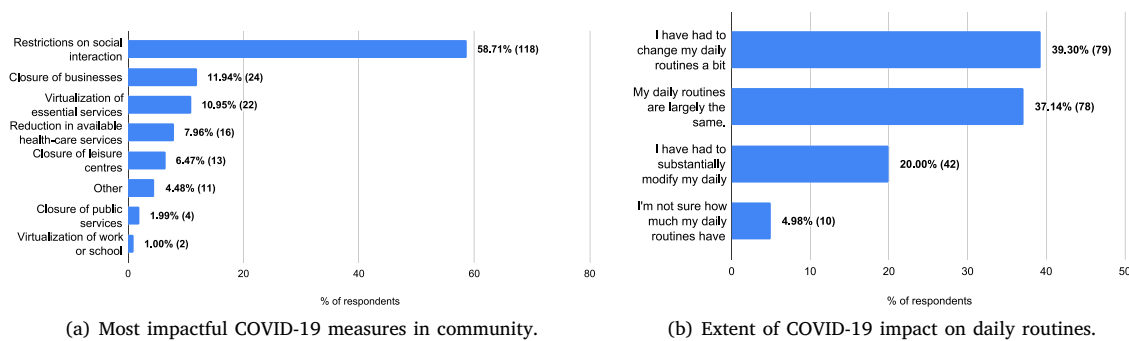


Fig. 1. Impact of COVID-19 changes ( $N=210$ , single – select).

eased, allowing limited social bubbles and essential travel; however, restrictions on large events and gatherings persisted throughout much of the pandemic (CBC News, 2021; CTV News, 2021). These measures are particularly relevant when studying older adults' information-seeking behaviors because the pandemic created an environment where access to traditional information sources—such as in-person interactions, libraries, and community events—was significantly disrupted.

Fig. 1(a) shows participants' responses on the most impactful changes in their community as included in Appendix A (Supplementary data) survey instrument (Challenges-Related Questions, Question 2). As illustrated in Fig. 1(a), restrictions on social interaction emerged as the most impactful community change, limiting older adults' access to social networks and trusted information channels (Wu, 2020). Business closures and the transition to online services were also commonly cited, reflecting both economic challenges and increased dependence on digital platforms for healthcare, education, and social support.

Furthermore, our analysis revealed significant correlations between COVID-19 impact and participants' employment status (Chi-squared test,  $\chi^2 = 26.53$ ,  $p = 0.005$ ) as well as their financial status (Chi-squared test,  $\chi^2 = 71.02$ ,  $p < 0.001$ ). This suggests that the ability to access and engage with information resources varies across demographic groups, with employment and financial stability playing crucial roles in shaping individuals' experiences and influencing their reliance on digital platforms for information.

Regarding changes to daily routines (Appendix A (Supplementary data) survey instrument: Challenges-Related Questions, Question 3), the data (Fig. 1(b)) shows that most participants reported making at least some adjustments to their daily routines during the pandemic, while a smaller portion indicated major lifestyle changes or no change at all. This pattern suggests that older adults demonstrated flexibility and varying levels of adaptation to new circumstances, reflecting both resilience and differences in how individuals coped with the disruptions of the health crisis.

When asked to describe changes to their daily routines in an open-ended question (Appendix A (Supplementary data) survey instrument: Challenges-Related Questions, Question 4), participants provided rich insights into how their daily lives were affected. Table S2.1 in Appendix A (Supplementary data) survey instrument provides the list of the most frequent words with their corresponding frequency counts, sorted in descending order. The participants' responses revealed six key themes:

1. **Social Isolation and Limited Social Interaction:** A predominant theme was reduced social engagement, with many participants mentioning the inability to visit family, friends, or attend social gatherings. This led to feelings of loneliness and emotional strain. One participant shared, "I have not been able to see my family members or get help from them in caring for my mother." Another stated, "Not being able to meet friends for coffee and a chat. I recently lost my husband, and being able to socialize was a godsend to me."

2. **Changes in Shopping and Errands:** Several participants reported altering their shopping habits by reducing in-person trips and shifting to online ordering or curbside pickup to minimize exposure. One participant noted, "I now only go to the grocery store once a month instead of weekly. I rely more on online shopping for essentials." Another shared their struggles with adjusting, "I find it hard to navigate websites for ordering groceries, but I try to manage."
3. **Disruptions in Physical Activity and Health Management:** Many participants experienced loss of access to exercise facilities and medical services, which affected their physical well-being. Some adapted by incorporating at-home workouts, while others found it difficult to maintain routines. One participant stated, "I used to go to the gym every morning, but now I just walk around my neighborhood." Another noted, "Not being able to see a doctor when I am having problems that need a visual check has been frustrating."
4. **Work and Volunteer Activity Adjustments:** Some participants transitioned to remote work, while others lost volunteer opportunities, disrupting their daily structure. One participant mentioned, "I now work from home. The biggest change is that I do not get to see my children and grandchildren like I used to." Others faced the cancellation of community involvement, such as "My volunteer work at a museum was canceled, and my support group meetings now happen on Zoom."
5. **Religious and Cultural Routine Disruptions:** The closure of places of worship and shifts to online religious services were commonly cited. Many participants described the difficulty of adapting to virtual religious engagement. One stated, "No worship in church. I watch services online, but it is not the same." Another participant mentioned, "Stopped all volunteer activities and social church gatherings."
6. **Emotional and Psychological Impact:** The cumulative effect of these routine changes led to feelings of boredom, frustration, and isolation. Several participants mentioned spending more time at home and feeling socially disconnected. One participant shared, "Life is very lonely now. I used to try to go somewhere every day to interact with people." Another described the emotional toll of staying home, saying, "I stay at home mostly every day, only occasionally going out for groceries."

Additionally, we found that routine change was significantly correlated with education (Chi-squared test,  $\chi^2 = 45.37$ ,  $p < 0.001$ ), as well as financial status (Chi-squared test,  $\chi^2 = 22.22$ ,  $p = 0.035$ ). These findings suggest that educational attainment and financial stability influence how some older adults adapt their daily routines and engage with digital resources, which in turn affects their information-seeking behavior and access to online services.

#### 4.1.3. Technological challenges: Adoption of online tools

In this study, we aimed to explore older adults' experiences with adopting new online tools and services in the context of evolving

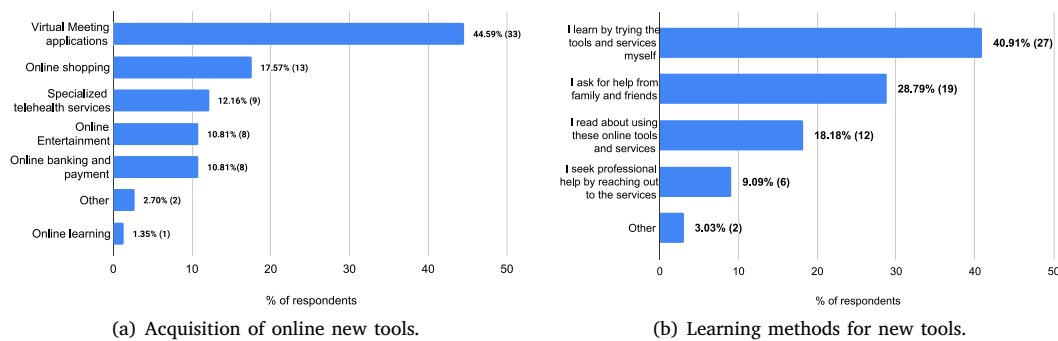


Fig. 2. Online tool acquisition and learning methods during the COVID-19 pandemic ( $N=210$ , multi – select).

digital environments. Specifically, we inquired whether participants had recently encountered the need to familiarize themselves with new online tools or services to support their information-seeking behavior as included in Appendix A (Supplementary data) survey instrument (Challenges-Related Questions, Question 5). Participants responses showed that the majority of respondents (168, 80%) reported not having required the adoption of any new online tools or services during this period. However, some participants, (41, 19.50%), acknowledged the necessity of learning new online tools or services in response to the challenges posed by the pandemic's circumstances. These findings suggest a level of comfort and familiarity with existing digital platforms among the recruited sample, which may be linked to the recruitment method. As participants were sourced from Qualtrics, there might be a pre-existing level of digital literacy and comfort with online platforms (Verma et al., 2021).

In the case that participants had to learn new tools, we inquired about the types of tools adopted and how they learned to use them (Appendix A (Supplementary data) survey instrument: Challenges-Related Questions, Question 6). Fig. 2(a) shows that virtual meeting applications were the most commonly learned tools, reflecting the widespread shift toward remote communication and virtual collaboration necessitated by social distancing measures among older adults in our sample. Participants also reported adopting online shopping and telehealth services, underscoring the growing importance of digital platforms for accessing goods and healthcare while adhering to safety protocols. By contrast, online entertainment and online banking/contactless payment tools were less frequently mentioned, suggesting diverse priorities and needs across participants. While most respondents selected from predefined survey options, only a small number reported other tools not listed in the survey (e.g., one participant noted, "I run a KaaS Knowledge as a Service model since 2013 so none of these are new to me nor our members").

Fig. 2(b) shows how participants learned to use new online tools (Appendix A (Supplementary data) survey instrument: Challenges-Related Questions, Question 7). Participants in our sample reported using a range of strategies. Most described a hands-on, exploratory approach, learning primarily by experimenting with the tools themselves. Many also relied on support from family and friends, underscoring the importance of social networks in technology adoption among older adults. Reading instructions or online guides was less common, and only a small minority sought professional assistance (e.g., contacting service support centers). Together, these patterns suggest that experiential learning and informal social support were the primary pathways through which participants acquired new digital skills.

#### 4.1.4. Technological challenges: Usability and confidence with online tools

We integrated questions from the System Usability Scale (SUS) into our study to evaluate the usability of online tools and services used by older adults to access COVID-19 information (Jordan et al., 1996) as included in Appendix A (Supplementary data) survey instrument

(Challenges-Related Questions, Question 8). These tools varied among participants and included government websites, health information portals (e.g., CDC, WHO), social media platforms, video conferencing tools (e.g., Zoom), and online shopping or telehealth services. Our primary aim was not to assess individual platforms separately but to understand older adults' overall perceptions of digital usability across the tools they relied on most during the pandemic.

Given this diversity, we treated the SUS score as a broad usability indicator rather than a platform-specific evaluation. This approach aligns with prior studies that have used SUS in heterogeneous digital environments to capture general usability trends across multiple tools (Sauro & Lewis, 2016). While specific usability barriers may vary across platforms, a composite SUS score helps highlight common challenges some older adults face in navigating digital systems under crisis conditions.

To analyze participants' experiences, we focused on two key items from the SUS: "I found the tools and services I use during COVID-19 very cumbersome" and "I thought the tools and services I use during COVID-19 were easy to use". Following recommendations by Lewis and Sauro (2018), these two items were prioritized as strong predictors of overall SUS variability. The resulting SUS score of approximately 66.27 (95% CI [62.88, 68.19]) suggests that the usability of the digital tools used during the pandemic was slightly below average, aligning with findings from Bangor et al. (2009) that place the average SUS score at 68 ("C" grade usability) (Sauro & Lewis, 2016).

Overall, our RQ1 findings show that older adults in our sample navigated both contextual and technological challenges by shifting from disrupted in-person channels (e.g., business closures and social restrictions) toward digital sources. Despite these constraints, 80% did not need to learn new tools, and those who did mainly relied on self-learning and peer support, suggesting notable adaptability and resilience in maintaining access to reliable information.

#### 4.2. RQ2: Usage of online resources

In RQ2, we examine how older adults use online resources to obtain health-related information during a crisis and how much they trust different sources and topics. We first describe the frequency and reasons for consulting online resources and the types of health topics sought, then examine which tools and platforms participants relied on most. Finally, we analyze patterns of trust in specific sources and how these relate to demographic and usability factors.

##### 4.2.1. Frequency of consulting online resources

The survey examined older adults' habits and frequency of consulting online resources for health-related information as included in the Appendix A (Supplementary data) survey instrument (Online Resources-Related Questions, Question 1). Understanding how often older adults turn to digital platforms for credible information provides insight into their information-seeking behavior and the role these

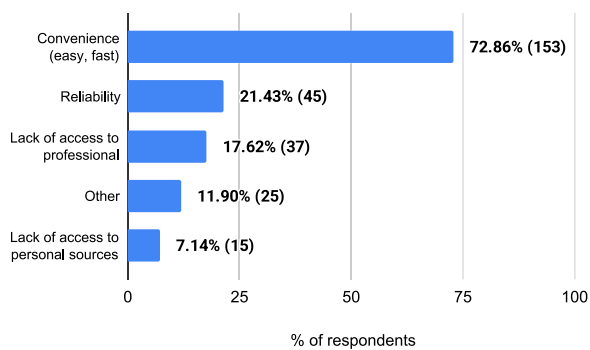


Fig. 3. Potential reasons for consulting online resources.

resources play in their daily decision-making and health management. Results showed that over half of the respondents reported consulting online resources for COVID-19 updates, either sometimes (64, 30.48%) or frequently (55, 26.19%). Additionally, a considerable percentage (45, 21.43%) mentioned that they always seek COVID-19 information online, underscoring a consistent reliance on digital platforms. Meanwhile, some participants (30, 14.29%) admitted to never seeking COVID-19 information online. While this may indicate reliance on alternative sources, it could also reflect other factors, such as information avoidance, mistrust of online sources, or passive information consumption through traditional media or interpersonal networks.

Furthermore, a smaller proportion (15, 7.14%) indicated that they consult online resources half of the time. While this group reported splitting their information-seeking between online and offline sources, our data do not capture the overall frequency or duration of their information-seeking activities. Therefore, we can only conclude that these participants did not exclusively rely on online platforms, but may have incorporated both digital and non-digital resources into their routines.

Additionally, we found a statistically significant correlation between the frequency of consulting online resources and both the age of participants (Chi-squared test,  $\chi^2 = 23.093$ ,  $p = 0.027$ ) and their education level (Chi-squared test,  $\chi^2 = 44.812$ ,  $p = 0.001$ ). Descriptively, more frequent consultation was more common among the younger segment of our sample and among participants with higher levels of formal education, indicating that the most digitally engaged older adults are also the most active in seeking health-related information online, in line with RQ2.

When asked about their reasons for consulting online resources (Appendix A (Supplementary data) survey instrument: Challenges-Related Questions, Question 5), participants most commonly emphasized convenience, as summarized in Fig. 3. Reliability was also frequently cited, along with a perceived lack of access to professional and, to a lesser extent, personal sources of information. A small proportion of respondents indicated other reasons or preferred not to answer. Overall, these responses suggest that older adults in our sample turned to online resources primarily because they were easy to access and viewed as dependable alternatives when offline sources were limited.

#### 4.2.2. Common health-related topics

The survey findings provide insights into the health-related topics older adults consult online resources for during crises (Appendix A (Supplementary data) survey instrument: Challenges-Related Questions, Question 4). These results illustrate how older adults in our sample seek information in times of uncertainty. As shown in Fig. 4(a), participants most frequently consulted online resources for statistics about new cases and death rates, as well as for information about government policies and public health guidelines. In contrast, fewer respondents reported seeking information on diagnosis, symptoms, protection measures, or potential treatments, and some indicated other

topics of interest. Overall, this pattern suggests a strong focus on monitoring the broader evolution of the crisis and understanding policy responses, rather than on detailed clinical or treatment information.

#### 4.2.3. Usage and trust of online health-related resources

When asked about which tools they used to gather information during a health crisis, older adults in our sample reported drawing on a diverse range of resources (Appendix A (Supplementary data) survey instrument: Challenges-Related Questions, Question 6), as summarized in Fig. 4(b). As illustrated in Fig. 4(b), participants relied predominantly on traditional and authoritative online sources, with news and government websites emerging as the primary channels for information. Online search engines and digital news outlets (e.g., newspapers, journals, academic articles) were used to a lesser extent, while engagement with social media, forums, and partisan sites was minimal. This pattern highlights older adults' preference for credible, institutionally anchored sources when seeking health-related information online.

We found similar usage patterns when looking at the trust of online resources when searching for health information as included in Appendix A (Supplementary data) survey instrument (Challenges-Related Questions, Question 7). Fig. 5 shows responses when we asked participants to assess their trust in COVID-19 related information across various sources. The results showed that traditional outlets like news and government websites, alongside established ones such as online newspapers, journals, and academic articles, enjoy a relatively high level of trust. A notable portion of respondents expressed moderate to high levels of confidence in these sources. On the other hand, trust in partisan sites and social media platforms for health information appears to be significantly lower, with a majority indicating limited to no trust in these channels. Forums and blogs yielded mixed trust levels, suggesting uncertainty or skepticism among older participants in our sample. Further, online search engines garnered a moderate level of trust, indicating some reliance on these platforms for health-related information. Overall, older adults in our sample exhibit a cautious approach toward less credible sources when seeking health-related information, reflecting their selective engagement and preference for more trusted resources (Vivion et al., 2024).

Results also showed a statistically significant correlation between trusting different online information sources and the frequency of consulting online resources (Chi-squared test, News and Government Websites:  $\chi^2 = 820$ ,  $p < 0.001$ ; Partisan Sites:  $\chi^2 = 28.203$ ,  $p = 0.005$ ; Forums and Blogs:  $\chi^2 = 47.4$ ,  $p = 0.001$ ; Social Media:  $\chi^2 = 109.97$ ,  $p = 0.001$ ; Online Search:  $\chi^2 = 52.474$ ,  $p = 0.001$ ). These correlations indicate that participants who frequently consult online resources are more likely to hold strong views — either positive or negative — about the trustworthiness of specific sources. In particular, frequent users tended to place higher trust in news and government websites and lower trust in partisan sites and social media. This pattern suggests that increased engagement with online information can reinforce reliance on institutional, authoritative sources while sharpening skepticism toward less credible outlets, directly informing RQ2 on how older adults evaluate and use different online information channels.

Further, there was a significant correlation between trusting news & government websites and both age (ANOVA test,  $F = 2.525$ ,  $p = 0.0422$ ) and SUS score (ANOVA test,  $F = 3.068$ ,  $p = 0.018$ ). Post-hoc analysis revealed that participants aged 75 and older reported the highest trust in news and government websites ( $M = 4.07$ ,  $SD = 0.88$ , 95% CI [3.84, 4.29]), followed by those aged 65–69 ( $M = 3.85$ ,  $SD = 0.99$ , 95% CI [3.57, 4.13]) and 60–64 ( $M = 3.40$ ,  $SD = 1.12$ , 95% CI [3.11, 3.69]). Participants aged 70–74 expressed comparatively lower trust ( $M = 3.33$ ,  $SD = 1.05$ , 95% CI [3.00, 3.65]). These findings suggest that older participants are more likely to trust established sources like news and government websites, which aligns with previous research showing older adults' preference for familiar and authoritative information channels (Zulman et al., 2011). The correlation with SUS scores indicates that participants with higher digital usability scores

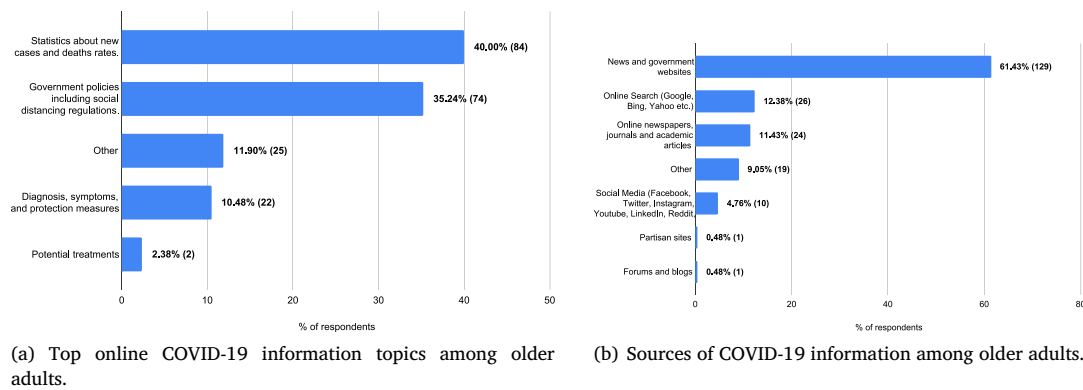


Fig. 4. Usage of resources to get COVID-19-related information (N=210, single – select).

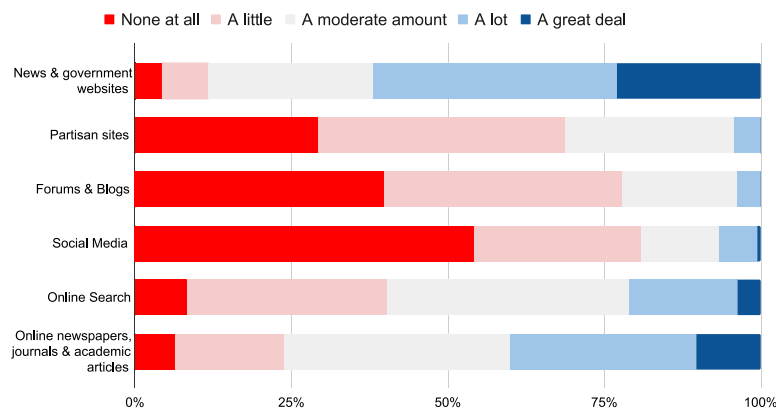


Fig. 5. Overall trust of different online information resources (Color scheme: higher trust in blue, lower trust in red). (For interpretation of the references to color in this figure legend, the reader is referred to the web version of this article.)

may have greater confidence in navigating these sources, reinforcing their trust in credible outlets.

Our RQ2 findings indicate that older adults in our sample demonstrated high digital literacy and confidence in using online resources during a health crisis, with nearly all actively engaging in online information-seeking and prioritizing convenience and reliability (e.g., case statistics and government policies). They tended to avoid unreliable sources, expressing highest trust in news and government websites over partisan sites and social media. Significant correlations between trust, frequency of online consultation, age, and SUS scores highlight how demographic and usability factors shape their digital engagement and information-seeking behavior.

#### 4.3. RQ3: Discernment accuracy: Distinguishing true and false information during a health crisis

In RQ3, our aim was to assess the extent of older adults' ability to accurately recognize and discern misinformation during a health crisis, using the COVID-19 pandemic as a case study. To achieve this, participants were presented with eight different statements around the pandemic and were asked to assess their accuracy as included in Appendix A (Supplementary data) survey instrument (Exposure to the coronavirus misinformation Questions, Question 1). The complete list of statements shown to participants is provided under the Debrief section in Appendix A (Supplementary data) survey instrument. For each statement, participants were required to indicate whether they believed it to be true, false, uncertain, or if they had not encountered it previously.

##### 4.3.1. Correctness score

Results showed that the mean correctness score for participants was  $0.458 \pm 0.209$  suggesting that the average participant correctly identified less than half of the total statements. Looking at the distribution of correctness score (see Fig. 6(a)), we can observe that the correctness scores are widely distributed, but there is a noticeable concentration of scores around certain values. Most scores appear to cluster between 0.25 and 0.75, indicating a range of performance levels among participants.

To better understand the factors influencing the ability to correctly answer the questions, we conducted a regression analysis. In the mixed-effects regression analysis, the dependent variable was correctness (a binary variable indicating whether the answer was correct or incorrect). The fixed effects included all variables significantly correlated with the correctness score, as well as variables identified in the literature as influencing the ability to accurately identify information. Table 2 summarizes all the factors considered for the regression analysis including variables significantly correlated with the correctness score as well as variables considered due to prior research.

The results of the regression analysis identified several statistically significant predictors of correctness (summarized in Table 3). The frequency of consulting online resources ( $\chi^2 = 9.413, p < 0.01$ ) was positively associated with the accuracy of responses, indicating that older participants who frequently consulted online sources were more likely to correctly identify accurate information. Similarly, a preference for using online resources ( $\chi^2 = 5.782, p < 0.05$ ) significantly correlated with higher correctness scores, suggesting that older adults in our sample who favor online platforms for information are better at identifying correct information. Further, the usability of online resources ( $\chi^2 = 4.228, p < 0.05$ ) also emerged as a significant predictor. While this finding underscores the value of user-friendly design, it is important to

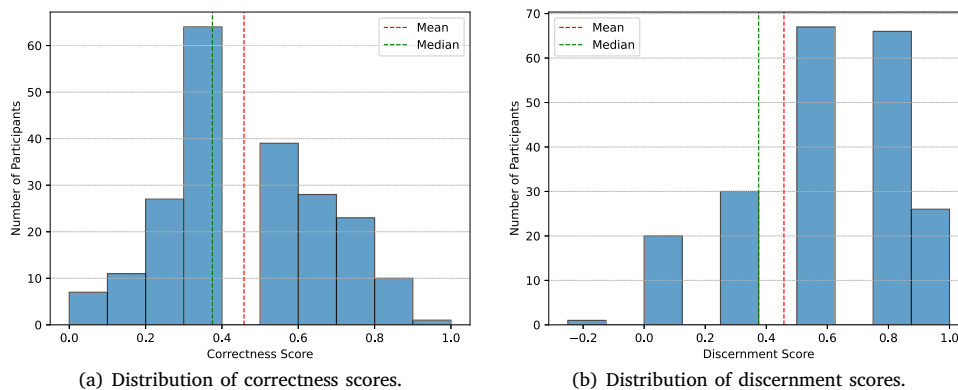


Fig. 6. Identification and discernment of coronavirus misinformation.

Table 2  
Factors associated with correctness and discernment scores.

Measure	Factor	F/ $\chi^2$	N	p-value	$\eta^2/V$
Correctness score	Self-perceived knowledge (Q13)	5.3536	210	<.01	.116
	Online consulting frequency (Q22)	2.5346	210	<.05	.0585
	Checking correctness frequency (Q39)	4.89	210	<.01	.985
	Online resources preference (Q23)	3.324	210	<.05	.031
	Health condition	Not significant			
	Education level	Not significant			
	Gender	Not significant			
	Age	Not significant			
Discernment score	Usability (Q21)	Not significant			
	Level of self-perceived knowledge (Q13)	3.1292	210	<.01	.0712
	Frequency of checking veracity (Q39)	3.13	210	<.05	.985
	Online consulting frequency	Not significant			
	Education level	Not significant			
Frequency of checking veracity (Q39)	Age	Not significant			
	Frequency of encountering misinformation (Q40)	50.97	210	<.01	.348
	Financial status (Q7)	12.768	210	<.05	.174

Note: N = sample size; V = Cramer's V (effect size for the chi-square test). Health condition, education level, gender, age, and usability factors were selected based on prior work on older adults and digital engagement (Aslett et al., 2021; Chen et al., 2015; Planagin & Metzger, 2007; Guess et al., 2019; Hernandez et al., 2008; Hussein et al., 2020; Liao & Fu, 2014; Lichtenberg et al., 2016; Pan et al., 2021; Seo et al., 2021).

note that SUS scores are self-reported and may reflect both the inherent usability of the platforms and users' prior digital experience. Thus, it remains possible that participants with greater familiarity or confidence in navigating online resources also perceived them as more usable.. Next, self-perceived knowledge ( $\chi^2 = 13.702, p < 0.001$ ) was another critical factor, with higher self-assessed knowledge levels correlating with better accuracy in identifying correct statements.

Our study investigated older adults' performance in accurately identifying true and false statements, revealing common misconceptions and areas of accurate knowledge. Table 4 summarizes the findings. The analysis showed that participants had high accuracy in recognizing true statements about the severity of COVID-19 for older adults and its primary transmission method, while they struggled with statements regarding the virus's spread in hot climates and the effectiveness of hair dryers in killing the virus.

When examining false statements, we categorized them by content, revealing that conspiracy theories were the least likely to be heard, with many participants (59.17%) reporting they had never heard these claims before. False cures also had a high "never heard" response rate (55.79%). In contrast, participants were more knowledgeable about the origin and spread of COVID-19, with only 18.31% reporting they had never heard these statements, and even more so about infection risks and symptoms (11.58%).

Notably, the "never heard" rate was very high for certain false claims, like the assertion about the Italian Government preventing

migrants from being tested, which 92.3% of participants had never encountered. This suggests that misinformation about other countries' news is less widely spread or recognized among older participants in our sample.

In terms of correctness, participants demonstrated the highest accuracy in statements related to symptoms and infection risks (68.30%), reflecting effective communication and awareness efforts. However, they struggled significantly with identifying false conspiracy theories, with the lowest correct rate at 26.93%. This low accuracy may be attributed not to poor judgment but rather to the fact that many participants had not heard these conspiracy theories before.

#### 4.3.2. Discernment score

Results showed that the mean discernment score for all participants was  $0.553 \pm 0.27$ . This indicates that participants are more sensitive to true statements than false ones and generally have a good ability to discern the truth. Looking at the distribution of discernment scores (See Fig. 6(b)) indicates that most participants had scores ranging between 0.5 and 1. This lack of symmetry, with a skewness of approximately  $-0.39$ , suggests a slight negative skew. This means the distribution has a longer or fatter tail on the left side, indicating that while most participants show moderate to high sensitivity to true information (i.e., they are more likely to correctly identify true statements than to incorrectly identify false statements), there is a minority with notably lower discernment scores. Further, one potential explanation for the

**Table 3**  
Summary of regression analysis results for correctness score.

Predictor	Estimate	Std. error	95% CI	z-value	p-value	$\chi^2$ (Hierarchical)
Intercept	-4.782	1.349	[-7.426, -2.138]	-3.545	<.001***	
Age	-.004	.012	[-0.028, 0.020]	-.314	.753	0.098 (.755)
Education level	-.071	.084	[-0.236, 0.094]	-.844	.399	0.699 (.403)
Online consulting frequency	0.229	.074	[0.084, 0.374]	3.095	.002**	9.413 (.002)
Checking correctness frequency	.175	.143	[-0.106, 0.456]	1.225	.221	1.498 (.221)
Online resources preference	.456	.188	[0.087, 0.825]	2.419	.016*	5.782 (.016)
Health condition	.101	.097	[-0.089, 0.291]	1.032	.302	1.063 (.303)
Gender	-.089	.158	[-0.398, 0.220]	-.561	.575	0.307 (.58)
Usability	.038	.019	[0.001, 0.075]	2.066	.039*	4.228 (.039)
Self-perceived knowledge	0.369	.098	[0.177, 0.561]	3.754	<.001***	13.758 (<.001)
<b>Model fit statistics:</b>						
AIC: 1916.3	BIC: 1981.2		Log likelihood: -946.2			
Deviance: 1892.3	Degrees of freedom residuals: 1635					

Note: Gray highlights indicate statistically significant factors from the regression analysis. CI = confidence interval.

\* Significance code:  $p < .05$ .

\*\* Significance code:  $p < .01$ .

\*\*\* Significance code:  $p < .001$ .

**Table 4**  
Accuracy of identifying COVID-19 statements.

Statement	Accuracy
True statements	
While COVID-19 is spreading rapidly, most people will experience only mild or moderate symptoms.	.658
There have been relatively few COVID-19 infections among children.	.543
The vast majority of people who have contracted the new coronavirus to date have recovered or are recovering.	.761
COVID-19 is often more severe in people 60+ yrs or with health conditions like lung or heart disease, diabetes or conditions that affect their immune system.	.970
COVID-19 virus can be transmitted in areas with hot and humid climates. <sup>a</sup>	.458
COVID-19 appears to spread primarily from person to person, rather than via food.	.873
Hand dryers are not effective in killing the new coronavirus. <sup>a</sup>	.277
Smoking puts people at higher risk for a severe case of the COVID-19 virus.	.535
False statements	
The COVID-19 virus was stolen out of a Canadian lab by Chinese spies. <sup>a</sup>	.375
The COVID-19 virus contains 'HIV-like insertions,' suggesting it was engineered. <sup>a</sup>	.324
The COVID-19 pandemic was predicted in a simulation. <sup>a</sup>	.075
A group funded by Bill Gates patented the COVID-19 virus. <sup>a</sup>	.463
The COVID-19 virus is a manmade bioweapon.	.543
5G cell phone technology is linked to the coronavirus outbreak. <sup>a</sup>	.452
Colloidal silver can cure COVID-19. <sup>a</sup>	.225
Miracle Mineral Solution can cure COVID-19. <sup>a</sup>	.279

Note: Gray highlights.

<sup>a</sup> Indicate statements with less than 0.5 accuracy.

high discernment scores among participants is that, when faced with misinformation, they are more likely to report an inconclusive answer than to answer incorrectly. This suggests that participants were not exposed to the most popular misinformation during the pandemic period, leading to higher sensitivity to true information in their responses.

Next, our analysis revealed significant correlations between the discernment score and participants' self-perceived knowledge (ANOVA test,  $F = 3.129$ ,  $p < 0.001$ ) as well as their frequency of checking the veracity/correctness of COVID-19 information (ANOVA test,  $F = 3.13$ ,  $p < 0.05$ ). A normal linear regression model was applied using each participant's discernment score as the dependent variable, with self-perceived knowledge and frequency of checking correctness as the predictors. These results showed that perceived knowledge was a significant positive predictor of discernment score ( $p < 0.05$ ), while the frequency of checking correctness was not statistically significant. This suggests that feeling knowledgeable about COVID-19 was more strongly associated with accurately distinguishing true from false information (RQ3) than simply checking information more often.

Finally, inconclusive responses, indicating uncertainty or lack of prior exposure, comprised about 15% of all judgments ( $n = 5486$ ). Mean Discernment ( $0.553 \pm 0.27$ ) and Correctness scores ( $0.458 \pm 0.209$ ) were highly similar, suggesting that excluding inconclusive responses did not substantially change overall accuracy patterns. Inconclusive responses were slightly more common among participants aged

75+ ( $M = 0.55$ ,  $SD = 0.24$ ) than younger groups ( $M \sim 0.45$ – $0.47$ ), with minimal gender differences, indicating that these answers are better interpreted as cautious reasoning rather than systematic misinformation and supporting the robustness of our dual-measure approach.

Our RQ3 analysis shows that older adults in our sample, on average, correctly identified less than half of the statements presented, with higher self-perceived knowledge emerging as a significant predictor of better accuracy. At the same time, participants demonstrated a stronger ability to discern true from false information, with higher discernment than correctness scores, suggesting greater sensitivity to true items. Their lower accuracy on some false statements, particularly conspiracy-themed items, likely reflects cautious use of the "inconclusive" option and limited exposure to these narratives, rather than broad susceptibility to misinformation.

**4.4. RQ4: Verification strategies, responses to misinformation, and awareness of platform-based mitigation tools**

This section addresses RQ4, which focuses on how older adults verify online information, how they respond when encountering misinformation, and their awareness and use of platform-based mitigation tools. We begin by examining self-reported verification strategies and

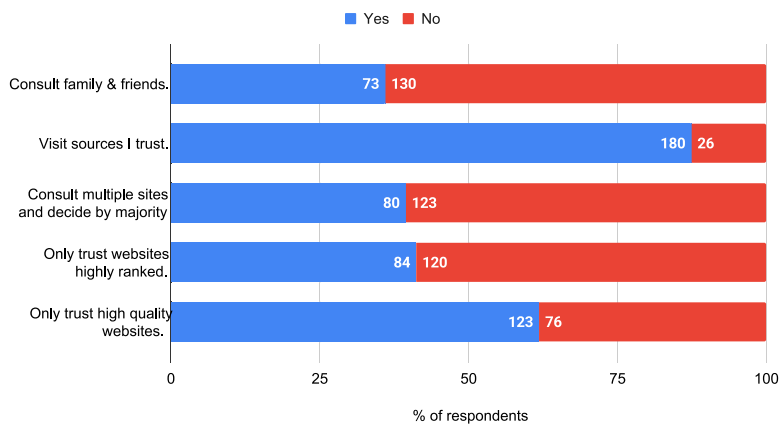


Fig. 7. Information verification techniques.

the frequency of encountering misinformation, then describe participants' typical responses to misleading or false content. We conclude by assessing awareness and uptake of platform initiatives to understand the extent to which these tools are reaching and supporting older adults.

4.4.1. Verification strategies

The survey results revealed a range of strategies that participants used to verify online information about COVID-19 (Appendix A (Supplementary data) survey instrument: Exposure to coronavirus misinformation, Question 2; Fig. 7). Most respondents reported relying on familiar and trusted sources and indicated that they primarily trust websites they perceive as high quality. Many also described using search engine rankings as a heuristic, checking sites that appear near the top of the results, or consulting multiple sites and comparing information across them. Some participants additionally turned to family and friends for verification. These findings point to a strong preference for familiar, high-quality sources and simple heuristics when evaluating the reliability of COVID-19 information online.

4.4.2. Responses to misinformation

The survey findings highlight participants' cautious approach to verifying COVID-19 information online as included in Appendix A (Supplementary data) survey instrument (Exposure to the coronavirus misinformation Questions, Question 3), with (142, 67.6%) actively checking the veracity of the information they encounter. However, some participants, (44, 21.0%), trust the information they find online, which may reflect a reliance on familiar sources. Further, the frequency of encountering perceived misinformation varied as included in Appendix A (Supplementary data) survey instrument (Exposure to the coronavirus misinformation Questions, Question 4), with (58, 27.62%) encountering it daily and (51, 24.29%) weekly. This frequency is consistent with findings by Swire-Thompson et al. (2020), who noted that regular exposure to misinformation is a common experience online. A meaningful portion of respondents encountering misinformation less than once a month (43, 20.48%) or never (21, 10%) could indicate that some older adults are less exposed to diverse online content, possibly due to selective browsing habits.

When faced with misinformation (Appendix A (Supplementary data) survey instrument: Exposure to the coronavirus misinformation Questions, Question 5), (116, 55.24%) participants reported that they chose to ignore it. While our survey did not explicitly probe participants' motivations for this behavior, similar patterns of avoidance have been discussed in the literature as possible responses to overwhelming or complex information environments (see, e.g., Vivion et al. (2024)). Meanwhile, (60, 28.57%) consulted other sources, which underscores the importance of cross-referencing information, a practice supported

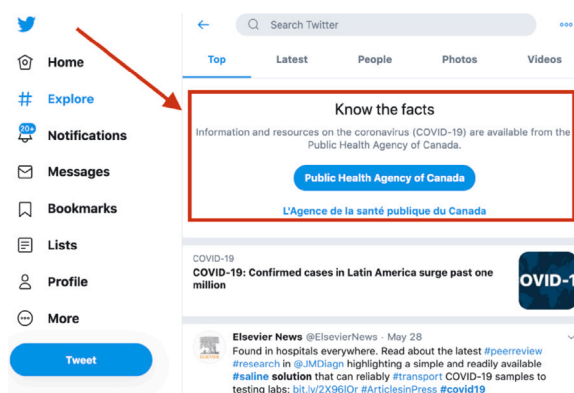


Fig. 8. Twitter's initiative to combat misinformation: Linking explicitly to trusted sources when users search for 'COVID' on the platform.

by Vraga and Bode (2017) as an effective way to combat misinformation. Among study participants, relatively few took steps such as reporting misinformation (11, 5.24%) or limiting their use of certain platforms (16, 7.62%). These findings point to a potential need for greater awareness and improved interventions to facilitate proactive engagement with misinformation.

4.4.3. Perceptions of platform-based mitigation tools

We showed participants different initiatives introduced by various online platforms (Twitter (now renamed to X), Google, YouTube, and Facebook (now renamed to Meta)) to combat misinformation during the pandemic. While these efforts were not specifically designed for older adults, they represented timely interventions to address the rapid spread of misinformation during a fast-paced health crisis. We asked participants about their awareness and opinions regarding these efforts. Fig. 8 illustrates the crisis management initiative launched by Twitter (X). The full list of initiatives that participants were asked about are listed under the Social Media Platform New Features Questions section in Appendix A (Supplementary data) survey instrument.

The findings indicate that participants are largely unaware of the initiatives introduced by online platforms to combat misinformation. Regarding Twitter's "Know The Facts" initiative, (104, 50.24%) had never heard of it, and (75, 36.23%) were unsure or did not use Twitter. Only a small fraction, (4, 1.93%), reported using it sometimes. Similarly, for Facebook's fact-checking initiative, (108, 53.21%) were unaware, and (41, 20.29%) were unsure or did not use it. Only (8, 3.86%) used it sometimes. Google's "COVID-19 alert" initiative was unfamiliar to (132, 63.16%), and (10, 4.78%) were unsure or did not use it, with only (21, 10.05%) using it sometimes. Lastly, YouTube's

misinformation combat initiative was unknown to (134, 65.85%), and (36, 17.56%) were unsure or did not use it, with only (9, 4.39%) using it sometimes.

Results show that many participants were unaware of misinformation mitigation initiatives introduced by social media platforms. However, to fully interpret this finding, it would be important to understand how frequently participants engaged with these platforms. While our survey did not explicitly ask about the frequency of social media use, participants did report their most frequently used online resource for COVID-19 information as included in Appendix A (Supplementary data) survey instrument (Online Resources-Related Questions, Question 6). Among all the participants, only (10, 4.76%) reported social media as their primary source of COVID-19 information. Within this group, a substantial proportion demonstrated limited awareness of platform-based misinformation mitigation initiatives. For example, when asked about Twitter's misinformation initiative, 3 participants stated they had never heard of it, and 5 reported having heard of it but did not use it; only 1 participant reported using it sometimes, and another was unsure. A similar pattern emerged for Facebook and Google initiatives, where most participants had either never heard of the features or had not used them. For YouTube's mitigation feature, 6 were unaware of it, 2 had heard of it but did not use it, 1 used it sometimes, and 1 was unsure.

Our RQ4 findings show that older adults in our sample primarily relied on familiar, high-quality sources to verify information, yet some still trusted online content without verification and most chose to ignore misinformation when they encountered it. The frequency of exposure to misinformation varied across participants, and awareness and use of platform-based initiatives to combat misinformation were generally low. This limited engagement with platform tools during a fast-paced health crisis underscores the need for more targeted communication and design strategies to ensure such interventions effectively reach and support older adults.

## 5. Discussion and future work

### 5.1. Summary of empirical contributions

This section summarizes the key empirical findings of our study, organized around the four research questions (RQs). Most notably, we found that older adults in our sample demonstrated high digital literacy and strong reliance on trusted online sources, which corresponded with limited susceptibility to misinformation. However, gaps remain in accurately identifying falsehoods and in awareness of online platform-based interventions for misinformation. These patterns suggest both strengths and vulnerabilities in older adults' digital engagement during health crises. A summary of the empirical contributions is provided under Table S3.1 in Appendix A (Supplementary data), mapping each research question to its supporting empirical findings.

#### *RQ1: Challenges in seeking information during a health crisis*

RQ1 examined both contextual and technological challenges encountered by older adults during the pandemic. Our findings indicate that most participants did not encounter substantial technical barriers when seeking information during the health crisis and had already incorporated digital platforms into their daily lives. This contrasts with prior work that highlights common barriers to digital engagement among some older adults—such as cognitive decline, physical impairments, and lower confidence with technology use (Charness & Boot, 2009; Gitlow, 2014; Rosenberg et al., 2009).

Instead, the primary challenges appeared to be contextual and social in nature. Social interaction restrictions were reported as the most impactful pandemic-related change, consistent with prior research on loneliness and social isolation among older adults during COVID-19 (Klaiber et al., 2021; Simons et al., 2021). These restrictions likely influenced how some older adults accessed information, prompting

increased reliance on digital platforms as a substitute for in-person interactions and support. While this shift does not reflect a technological barrier per se, it highlights how reduced offline engagement created new pressures on online information-seeking behavior.

Our study also adds nuance to the digital divide debate. While prior work emphasizes widespread barriers among some older adults, recent literature suggests increasing diversity in digital proficiency within this demographic (Ghenai et al., 2023). Our findings support this shift: the lack of a need to adopt new tools, combined with moderate usability scores and high reliance on trusted digital sources (e.g., government and news websites), suggests that a substantial portion of this sample had the digital familiarity required to access online information effectively.

Although usability challenges were not explicitly reported, prior research shows that crisis situations introduce new cognitive and emotional demands that may not be captured by standard evaluations (Aula, 2005; Dolničar et al., 2016; Kobayashi et al., 2011; Salman et al., 2018). This points to a broader challenge: existing tools may be “good enough” for routine use but not optimized for high-pressure contexts. As such, platforms that are generally usable may still require redesigns to support decision-making under stress, urgency, or uncertainty, an issue we revisit in our practical implications (Section 5.2).

#### *RQ2: Use and trust of online resources*

Our findings highlight how older adults in our sample used and trusted online resources to obtain health-related information during a crisis. Participants largely chose online sources for their convenience and perceived reliability, consistent with prior work showing that ease of access is a key driver of digital tool adoption among some older adults (Gitlow, 2014; Hargittai et al., 2019; Ihm & Hsieh, 2015).

Our study extends this literature by showing how these motivations become particularly pronounced under crisis conditions. Participants prioritized sources that provided rapid, actionable, and authoritative updates — such as case statistics and government policy information — rather than more general health content. By contrast, relatively few reported seeking detailed information about diagnoses or symptoms, despite prior research suggesting older adults' strong interest in broader health topics (Vivion et al., 2024). This discrepancy suggests that, during a crisis, some older adults may experience information overload and therefore focus on immediate, clear, and directly actionable information, a pattern aligned with Information Overload Theory (Toffler, 2021).

When examining trust explicitly, our empirical findings demonstrate clear differentiation across online sources. Government and digital news websites were both the most frequently used and the most trusted, reflecting a preference for authoritative and familiar channels, while social media, partisan sites, forums, and blogs were viewed with substantially more skepticism. Interestingly, academic and journalistic long-form sources (e.g., online journals, academic articles) were perceived as credible but remained relatively underused. This suggests that trustworthiness alone does not determine use; rather, older adults in our sample appeared to prioritize sources that combine credibility with familiarity, usability, and concise presentation.

Taken together, these patterns indicate that older adults engaged in strategic, selective use of online information: relying heavily on authoritative, easily accessible sources and minimizing interaction with channels perceived as less reliable, less familiar, or more complex to navigate. Future research could examine whether similar selective trust and usage patterns emerge in other types of crises, helping to refine targeted digital communication strategies for older adults in emergency contexts.

### RQ3: Discernment accuracy: Distinguishing true and false information during a health crisis

Our findings provide empirical evidence about older adults' ability to identify and discern accurate information during a health crisis. Overall, participants correctly identified fewer than half of the statements presented, yet showed a stronger ability to distinguish true from false information when they committed to a judgment. This gap reflects, in part, the role of "inconclusive" responses: lower correctness can arise from cautious non-commitment rather than systematic endorsement of false claims, whereas the discernment measure captures accuracy only when participants chose "true" or "false". Taken together, these metrics suggest that older adults in our sample were relatively better at recognizing true information than explicitly labeling misinformation as false and often preferred to withhold judgment when uncertain.

Methodologically, the use of both correctness and discernment scores represents an important extension of prior work that has typically relied on a single accuracy or susceptibility metric (e.g., [Penneycook et al., 2020](#); [Roozenbeek et al., 2020](#)). By separating overall correctness from discernment, our approach distinguishes between general knowledge gaps, cautious uncertainty, and targeted misinformation detection. This dual-metric framework offers a more nuanced view of information resilience than single-score approaches, enabling researchers to identify cases where individuals avoid endorsing misinformation yet still struggle to confidently reject it. We see this as a promising direction for future misinformation research, particularly in populations like older adults where caution, prior exposure, and confidence may play distinct roles in shaping response patterns.

Our analyses also revealed key factors associated with better discernment. Higher self-perceived knowledge, more frequent consultation of online resources, and greater perceived usability of those resources were all positively related to performance, suggesting that familiarity, confidence, and ease of use jointly support older adults' ability to navigate complex information environments. At the same time, participants' selective reliance on authoritative sources—such as government and digital news websites—and limited engagement with high-misinformation channels (e.g., partisan sites, some social media) likely further supported their ability to avoid common misinformation narratives. These patterns underscore that discernment accuracy depends not only on cognitive evaluation of content, but also on where older adults choose to seek information and how they respond when uncertain—a theme we explore further in RQ4 when examining their verification strategies, responses to misinformation, and awareness of platform-based mitigation tools.

### RQ4: Verification strategies, responses to misinformation, and awareness of platform-based mitigation tools

Our findings for RQ4 show how older adults in our sample verify online information, how they respond when encountering misinformation, and how aware they are of platform-based mitigation tools.

**Verification strategies.** Most participants reported relying primarily on familiar, trusted sources when seeking to verify information, and many also used heuristic cues such as visiting highly ranked websites in search results or cross-checking multiple sites for consensus. While these strategies are consistent with prior work on older adults' information-seeking behaviors, they also raise concerns about the perceived reliability of algorithmically ranked content, given that search algorithms often prioritize engagement rather than accuracy ([Höchstötter & Lewandowski, 2009](#); [Pan et al., 2007](#); [White & Hassan, 2014](#)). Our results extend prior research ([Gottfried et al., 2013](#); [Hargittai et al., 2019](#)) by empirically illustrating how older adults lean on platform- and interface-level cues, rather than explicit fact-checking tools, when making credibility judgments.

**Responses to misinformation.** We also observed a mix of trust and passivity in responses to misinformation. A non-trivial subset of participants reported generally trusting the information they encounter

online, and when confronted with content they perceived as misleading or false, more than half indicated that they typically ignore it rather than challenge or report it. This passive stance is consistent with recent findings ([Tang et al., 2024](#)) and highlights a critical gap: even when misinformation is recognized, it is rarely actively corrected by older adults in our sample, limiting the potential for peer-to-peer debunking or corrective feedback in their networks.

**Awareness and perceived effectiveness of platform-based tools.** Finally, awareness and use of platform-based mitigation features (e.g., warning labels, fact-check flags) were generally low, even among those participants who reported using social media as a primary information source. This suggests that, for many older adults, misinformation management is handled through source selection and personal verification strategies rather than through engagement with platform interventions. As information habits diversify, increasing the visibility, clarity, and accessibility of these tools will be essential if they are to play a meaningful role for older users.

Together, these results indicate that while some older adults employ several common-sense strategies to verify information, gaps remain in both proactive engagement with misinformation and awareness of available mitigation tools, especially in crisis contexts where information overload is high and urgency can magnify risk-averse behaviors.

## 5.2. Practical implications and proposed interventions

### 5.2.1. Information overload and future pandemics

Results suggest that older adults may rely on passive coping strategies to manage cognitive overload during health crises, such as selectively engaging with familiar sources or ignoring overwhelming information. While these strategies can help reduce cognitive strain, they may also limit exposure to important updates or reinforce reliance on familiar but potentially incomplete information sources. Future research should further explore how older adults navigate high-volume information environments and how these behaviors impact engagement with crisis-related content.

To address information overload in future public health crises, digital platforms could integrate design features that simplify and structure information presentation. Research by [Eppler and Mengis \(2004\)](#) highlights the importance of effective information design and summarization techniques in mitigating overload. Applying these principles, digital tools could implement automated content summarization, tiered information structures that present critical updates first, or customizable filtering systems that allow users to prioritize information based on relevance and reliability. Additionally, adaptive trust indicators, which dynamically highlight verified sources and fact-checked content, could support older adults in identifying reliable information without increasing cognitive strain.

### 5.2.2. Confirmation bias and misinformation

The survey revealed a strong preference for familiar and high-quality sources when seeking reliable COVID-19 information. While this preference aligns with previous research on confirmation bias, our findings suggest that in crisis contexts, this tendency may become more pronounced due to heightened uncertainty and urgency. Older adults may rely more heavily on familiar sources not only for credibility but also for reassurance, reinforcing existing beliefs and limiting exposure to new or corrective information. This has implications for misinformation resilience, as the perceived reliability of a source may not always align with its actual accuracy. For instance, a source trusted by someone influenced by conspiracy theories can differ significantly from health authorities like the CDC or WHO, reinforcing biased information loops ([Guess et al., 2019](#)).

To address this, misinformation interventions should move beyond simply promoting high-quality sources and instead focus on how information is presented and framed within familiar sources. Platforms

could integrate trust-layered verification features, where fact-checked content is dynamically embedded within sources that users already engage with, reducing reliance on external fact-checking sites that may be perceived as unfamiliar or biased. Additionally, contextual credibility indicators, such as real-time reliability scoring mechanisms that highlight when a familiar source contradicts expert consensus, could help users critically evaluate their go-to sources without requiring them to seek alternative perspectives on their own.

### 5.2.3. Information verification and misinformation in online search

The information verification techniques adopted by nearly 40% of participants reflect common misconceptions, which can impact not only older adults but also younger populations (Ghenai et al., 2019). Some participants reported relying on website appearance, popularity, or search engine ranking as indicators of credibility, assuming that highly ranked or visually professional sites are more trustworthy. Others expressed trust in information that aligns with prior beliefs or is shared by familiar sources, reinforcing confirmation bias rather than independent fact-checking. These misconceptions are problematic because neither search engine ranking nor familiarity with a source guarantees accuracy, and visually polished misinformation can be as convincing as legitimate content. For instance, individuals seeking information about cancer treatments may unknowingly encounter algorithmically boosted misinformation, reinforcing false beliefs and skewing their perception of medical consensus.

Rather than solely focusing on improving search engine ranking algorithms, interventions should explore how users engage with and evaluate retrieved information. Integrating real-time credibility assessments within search results — such as dynamic credibility scoring, inline verification tags, or contextual fact-check overlays — could help users differentiate between high-quality medical advice and unreliable content. Building on prior work that advocates for presenting alternative viewpoints to combat misinformation (Bragazzi & Garbarino, 2024; Peter & Koch, 2019; Roozenbeek & Van Der Linden, 2022), we recommend “contrastive search features” that proactively present side-by-side summaries from credible, independent sources directly within the search results interface. Unlike traditional approaches that may append a fact-check or a counterpoint at the end of the results page (Garrett & Poulsen, 2019), contrastive search features in our conception would integrate real-time, side-by-side comparisons or summaries directly within the flow of search, prompting users to engage with both sides before forming a conclusion. For example, when searching for health information, users could see a visually distinct panel that not only highlights credible sources supporting a claim but also reputable sources offering an evidence-based counterpoint, along with brief, context-rich explanations about the consensus in the scientific community.

### 5.2.4. Engaging older adults in misinformation correction

The finding that many older adults in our sample reported ignoring misinformation on online platforms raises important questions about how to engage them in misinformation correction strategies. While previous research by Amazeen et al. (2019) suggests that older adults in the United States are more likely to share fact-checks in political conversations, this behavior may indicate an indirect method of correcting misinformation, where older adults passively contribute to debunking false information by amplifying reliable sources rather than directly confronting misinformation.

To make this strategy more effective, design interventions could focus on facilitating the discovery and sharing of fact-check resources in ways that align with older adults’ online behaviors and trust dynamics. For example, platform-integrated nudges, such as fact-check prompts embedded within social media feeds or trusted source indicators next to verified content, could encourage older adults to share fact-checked information more readily. Additionally, community-based fact-checking features that allow users to collectively validate and flag

misleading content could be adapted to accommodate older adults’ digital engagement styles.

Future research should explore what motivates or discourages older adults from engaging in misinformation correction, including factors such as trust in information sources, digital literacy, and concerns over online conflict. Understanding these motivations could help refine design strategies that lower the barriers to fact-checking participation while respecting older adults’ preferences for social engagement. Encouraging older adults to share fact-checks through subtle, non-confrontational prompts and personalized recommendation systems could serve as a realistic and effective misinformation intervention. Given older adults’ influence within their social networks, leveraging trusted networks and familiar platforms may be an essential part of strengthening misinformation resilience in this demographic.

### 5.2.5. Practical implications for design

While the HCI literature has advanced inclusive and participatory design for many user groups (e.g., individuals with disabilities, low digital literacy, and cognitive impairments) through rigorous work published in leading venues (Branham & Harrison, 2015; Clarkson et al., 2016; Smith et al., 2022; Zhao et al., 2019), our study reveals that during health crises, even digitally literate older adults encounter unique challenges with rapid information verification and awareness of mitigation tools—challenges not fully addressed by traditional usability practices.

Our empirical findings point to several actionable design implications that are particularly relevant in crisis contexts. First, our findings reinforce that digital literacy among older adults is not uniform, but spans a broad spectrum—from highly proficient users to those with substantial barriers to adoption (Hilbert, 2011; Sin et al., 2021; Van Dijk, 2020). In our sample, 80% of participants reported no need to adopt new tools during the crisis, reflecting strong digital familiarity. Beyond this general heterogeneity, which is also observed in younger cohorts, our results highlight a configuration that is distinctive for older adults in a health-crisis context: information seeking is embedded in higher health risk and service dependence, combined with a strong preference for authoritative, institutionally anchored sources (e.g., government and digital news websites), cautious use of “inconclusive” responses rather than endorsing questionable claims, and low awareness and uptake of platform-based mitigation tools despite frequent online use. For inclusive and effective digital interventions, design frameworks such as the Technology Acceptance Model (TAM) (Davis, 1989) should therefore be adapted to address both this diversity in skills and these age-specific patterns of engagement, supporting advanced and novice users through accessible interfaces, tailored guidance, and varying levels of support.

Second, our study found that while older adults exhibited digital literacy and a preference for trusted sources, their average accuracy in distinguishing misinformation was only 0.458, suggesting persistent challenges in online information evaluation. Building on these findings, we recommend a series of crisis-adaptive design strategies to better support older adults’ information-seeking and misinformation resilience. Specifically, platforms should incorporate features that address the observed tendency for “cautious engagement”, such as contextual pop-ups or “Not sure—show more” options when users express uncertainty about online claims. Trusted Source Navigators can help bridge the gap between familiar government/news sites and underutilized academic sources by presenting research summaries in plain language. To overcome low awareness of platform-based mitigation tools, interactive prompts and micro-quizzes can introduce and reinforce these features during relevant information searches. Additionally, subtle nudges — like “Want to let us know this looks wrong?” — can encourage users who passively encounter misinformation to take simple reporting or review actions, shifting behavior from passive to active.

Moreover, in response to our observation that older adults rarely visit external fact-checking sites, we recommend that platforms embed

real-time verification cues and succinct “Why this is trustworthy” tooltips directly alongside news stories and policy updates, reducing the need for users to seek information elsewhere. For example, inline explanatory banners could briefly summarize why a piece of information is credible — drawing on government or scientific validation — without requiring additional navigation. Similarly, platforms can display trusted source badges next to official information and offer “hover-to-explain” overlays that demystify academic jargon or clarify evolving policies in plain language. Drawing from our findings and the emerging promise of AI-powered virtual assistants (Alessandro et al., 2025; de Campos Filho et al., 2022), platforms should develop conversational, context-sensitive support tailored to older adults’ needs. Such assistants could proactively offer verification steps, summarize complex claims, or highlight when new fact-checking features are available, all presented in accessible and actionable formats.

These implications are drawn from empirical evidence that, in crisis settings, older adults rely heavily on trusted sources, seldom adopt unfamiliar tools or fact-checking mechanisms, and may be vulnerable to changes in platform design that do not prioritize rapid and context-aware support. Future research should assess which of these interventions most effectively support information verification and digital resilience for older adults, particularly under urgent or uncertain conditions.

## 6. Conclusion

Our study provides valuable insights into older adults’ information-seeking behavior, and familiarity with platform-based mitigation efforts during health crises, using COVID-19 as an illustrative example. Through a detailed survey, we examined how older adults navigate online information in times of uncertainty, finding that participants relied heavily on familiar and credible sources and demonstrated a strong ability to discern accurate information. However, the findings also highlighted significant gaps in awareness of platform-based misinformation mitigation initiatives, underscoring the need for more effective communication strategies and user-centric design of digital tools.

The study offers both theoretical and practical contributions to the understanding of older adults’ digital engagement. Our findings reveal that older adults exhibit a range of digital skills and information-evaluation strategies, reflecting their adaptability and resilience in navigating online environments. This diversity calls for tailored interventions that enhance older adults’ confidence in evaluating information accuracy while providing user-friendly tools to support their engagement with digital platforms.

The insights from this study are applicable not only during future health emergencies but also in broader contexts where misinformation proliferates during times of uncertainty. These findings highlight the importance of targeted communication strategies, interventions that leverage trusted sources, and further research to promote digital inclusion and strengthen older adults’ resilience against misinformation. By addressing these areas, we can better support older adults and other vulnerable populations in navigating an increasingly digital world.

## CRediT authorship contribution statement

**Amira Ghenai:** Writing – original draft, Supervision, Project administration, Methodology, Funding acquisition, Data curation, Conceptualization. **Xiaoning Wang:** Writing – original draft, Visualization, Investigation, Data curation. **Karyn Moffatt:** Writing – review & editing, Writing – original draft, Supervision, Resources, Funding acquisition, Conceptualization.

## Declaration of Generative AI and AI-assisted technologies in the writing process

During the preparation of this work the authors used ChatGPT for editorial support. After using this tool/service, the authors reviewed and edited the content as needed and take full responsibility for the content of the published article.

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## Declaration of competing interest

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests: Amira Ghenai reports financial support was provided by AGE-WELL NCE Inc. Karyn Moffatt reports financial support was provided by Natural Sciences and Engineering Research Council of Canada. Karyn Moffatt reports financial support was provided by Canada Research Chairs Program. If there are other authors, they declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

## Appendix A. Supplementary data

Supplementary material related to this article can be found online at <https://doi.org/10.1016/j.chbr.2026.101033>.

## Data availability

The authors do not have permission to share data.

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