

Review

# Navigating Privacy and Data Safety: The Implications of Increased Online Activity among Older Adults Post-COVID-19 Induced Isolation

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**Abstract:** The COVID-19 pandemic spurred older adults to use information and communication technology (ICT) for maintaining connections and engagement during social distancing. This trend raises concerns about privacy and data safety for older individuals with limited technical knowledge who have adopted ICT reluctantly and may be distinct in their susceptibility to scams, fraud, and identity theft. This paper highlights the gap in the literature regarding the increased privacy and data security risks for older adults adopting technology due to isolation during the pandemic (referred to here as quarantine technology initiatives (QTIs)). A literature search informed by healthcare experts explored the intersection of older adults, data privacy, online activity, and COVID-19. A thin and geographically diverse literature was found to consider the risk profile of QTIs with the same lens as for older adults who adopted ICT before or independent of COVID-19 quarantines. The mentioned strategies to mitigate privacy risks were broad, including education, transaction monitoring, and the application of international regulatory models, but were undistinguished from those for non-QTI older adults. Future research should pursue the hypothesis that the risk profile of QTIs may differ in character from that of other older adults, referencing by analogy the nuanced distinctions quantified in credit risk scoring. Such studies would examine the primary data on privacy and data safety implications of hesitant ICT adoption by older adults, using COVID-19 as a natural experiment to identify and evaluate this vulnerable group.

**Keywords:** older adults; data protection; privacy; technology adoption; COVID-19 pandemic; limited technical knowledge; scams; fraud; identity theft; risk mitigation



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## 1. Introduction

The COVID-19 pandemic has initiated a substantial shift in the behavior of older adults, causing a surge in their adoption of information and communication technology (ICT) [1–3]. This has been a crucial strategy to maintain connections and engagement during enforced social distancing [4,5]. However, this rise in digital communication has spawned significant concerns, particularly around privacy and data safety for older individuals, many of whom possess limited technical knowledge [6–8]. As a result, these individuals have become more susceptible to scams, fraud, and identity theft and are subject to rapid growth in related financial losses [9,10]. Moreover, there is reason to believe that older adults adopting ICT due to COVID-19 quarantine pressures may have distinct characteristics affecting their risk profile with respect to online privacy and data safety [11].

Other domains exhibit a relatively sophisticated consideration of how individual characteristics correlate with risk. Lending institutions take increasing advantage of the

available data regarding demographic characteristics, financial practices, personal decisions, and even social media presence to score credit risk [12,13]. The literature, including this journal, documents the maturation of tools, whether big data or machine learning, in distilling the quantified risk from nuanced personal characteristics [14–16].

The specific objective of this research is to highlight the increased privacy and data security risks for this unique group of older adults who, because of isolation during the pandemic, were propelled toward technology adoption. These individuals, referred to in this study as “quarantine technology initiates” (QTIs), represent a cohort distinct in their late and enforced engagement with technology. We pay special attention to whether studies characterize QTIs as having a distinct risk profile, or explicitly or implicitly treat them as identical to other older adults who have adopted ICT. Despite the increase in literature addressing the impact of the pandemic on technology adoption among older adults, there remains a notable gap in understanding the unique privacy risks faced by QTIs. This gap in knowledge is both significant and timely, given the rapid digital transition among this demographic, and its exploration forms the central focus of this paper.

To assess the treatment of online privacy and data safety risks of QTIs, we review the literature that addresses such risks for older adults within the context of COVID-19. Based on the studies identified, this article discusses the following research questions: What is the scope and depth of the literature addressing the online privacy and data safety risk profiles of QTIs? How are the risk characteristics of QTIs distinguished from other older adults? What implications do these differences have for risk mitigation efforts?

To achieve these objectives, this study is structured as follows: we begin with the introduction, where we briefly touch on the focal theme. Section 2 provides background and a comprehensive context, laying the groundwork for examining the implications of the increased use of ICT by older adults during the COVID-19 pandemic. Section 3 delineates the methodology employed with a specific emphasis on the scope and procedure of the literature search, informed by healthcare experts. This encompasses the selection criteria for studies, the databases searched, the search terms used, and the process for evaluating and selecting the appropriate sources for review.

In Section 4, we discuss the findings, including the emergent themes around mitigating privacy risks, and describe the limitations of our study. This includes a tabular summary of how the included articles characterize or fail to characterize the risk characteristics of QTIs. Finally, our Section 5 offers directions for future research, advocating for an examination of the primary data to understand the implications of hesitant technology adoption by older adults, particularly in the wake of the pandemic. Section 5 also recommends leveraging the natural experiment presented by COVID-19 to identify and evaluate this vulnerable demographic.

## 2. Background

### 2.1. Information and Communication Technology (ICT) Adoption among Older Adults

Older adults represent a diverse and distinct group of information and communication technology (ICT) users. While the youngest of older adults exhibit technology adoption rates comparable to the general population, the oldest individuals demonstrate significantly lower usage [17]. These rates have increased over time as younger, tech-savvy older adults age and technology penetration expands within each cohort [18–20].

The COVID-19 pandemic not only intensified the pre-existing crisis of social disconnectedness among older adults [21] but also accelerated their acceptance of social engagement technologies, particularly videoconferencing [1,2]. Haas et al. [3] found that 56% of older adults surveyed in a British Columbian study had altered their use of technologies for social purposes since the pandemic began, with a similar number adopting new relational technologies (see also [22]). The respondents communicated especially with friends and family, and frequently had family support for both adoption and ongoing use.

## 2.2. Online Privacy Risks for Older Adults and the Privacy–Security Trade-Off

However, this increased technology adoption also exposed older adults to online privacy violations and data theft, making them more vulnerable targets. The FBI's Internet Crime Complaint Center (IC3) reports that internet-related fraud losses by persons aged 60 and older nearly tripled from 2019 to 2022 and their share of total losses grew from 29% to 37% [9,23]. Grimes et al. [18] found that older adults were less aware of online security and the associated risks, with the differences potentially arising from cohort distinctions in computer-related training and usage. The authors emphasize the need to explore the extent to which older adults experience greater risk than younger cohorts due to their relative inexperience with technology. Ray [22] found similar risks among older adults who adopted videoconferencing technology during the pandemic, as many participants were so focused on overcoming barriers to using the software that they overlooked privacy concerns and neglected data safety hygiene.

Mortenson et al. [24] note that older adults can protect their privacy when using online communication platforms by being selective about the information they share or modify. The authors draw a parallel between the privacy sacrifices made to receive in-home care and those made to allow safety monitoring. Surveillance technology can improve safety and facilitate aging-in-place while presenting privacy and data security implications. As these technologies do not involve the agency of older adults, their privacy aspects are not addressed here. However, the authors' analogy could extend to privacy sacrifices resulting from online communication tools that enable social engagement without leaving home.

## 2.3. Unexplored Privacy Risks of Quarantine Technology Initiates (QTIs)

The existing literature consistently characterizes older adults as a highly heterogeneous group in terms of ICT adoption, yet collectively possessing lower digital literacy than younger cohorts [17,25,26]. Consequently, they are more susceptible to online privacy and personal data security risks [8,27]. While the pressure on older adults to adopt such technologies due to pandemic quarantines is broadly documented, the literature is notably sparse regarding the privacy risks faced by the least technologically savvy among this heterogeneous older cohort, who were encouraged or compelled to adopt technology solely to mitigate enforced isolation. This paper refers to these individuals as "quarantine technology initiates" (QTIs).

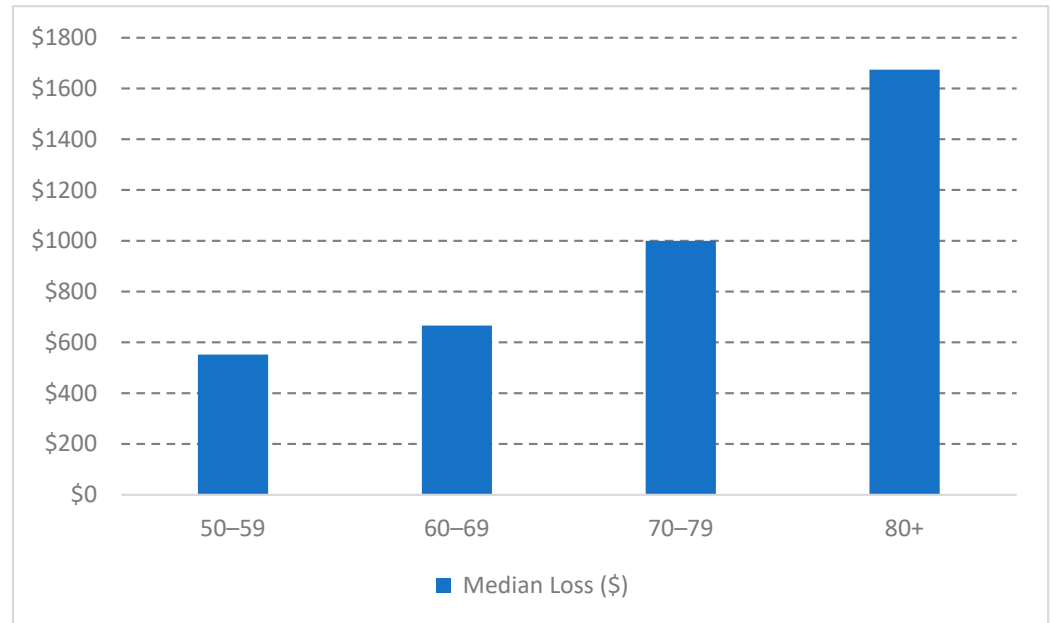
## 2.4. Online Risks and Stakes of Privacy and Data Safety Violations

Compared with other age groups, older adults encounter higher risks of online privacy and personal data breaches, primarily due to their generally lower risk awareness, limited knowledge of online safety, and increased susceptibility to scammers [28–31]. Their heightened anxiety surrounding technology further exacerbates this vulnerability among older adults compared with younger cohorts [32–34]. Additionally, older adults are less likely to participate in work- or school-based safety training or have access to support staff, often using computers in informal home or library environments [18,35]. A meta-analysis showed that financial fraud impacts roughly 1 in 18 older adults (5.4%) annually, excluding those who are institutionalized or cognitively impaired [36].

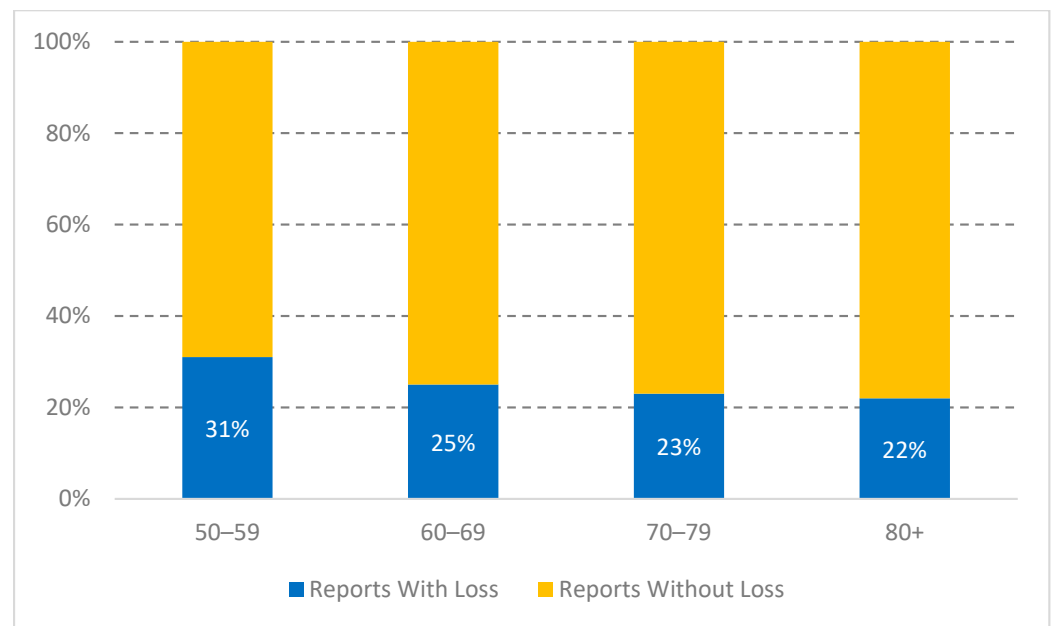
## 2.5. Fraud Trends among Older Adults: An Analysis Based on Federal Trade Commission (FTC) Data

The Federal Trade Commission (FTC) monitors trends in scams and associated losses, including privacy and data safety threats, through its Consumer Sentinel Network program [37]. Annually, the FTC compiles fraud reports (5.2 million reports in 2022) and demonstrates, as illustrated in Figure 1, that median fraud losses increase with age, while the proportion of reports reflecting a loss decreases with age (Figure 2) [10]. This indicates that the stakes of fraud and privacy violations escalate with age, exacerbating the disproportionate impact of financial loss on those with fewer working years available to recover from losses. However, conflicting research introduces uncertainty regarding the probability

of loss statistics, as fraud against older adults may be underreported more frequently than fraud against younger individuals [28], and older adults may be less susceptible to certain types of fraud [11].



**Figure 1.** 2022 U.S. median fraud loss by age (\$); adapted from [10].



**Figure 2.** 2022 U.S. fraud loss incidence by age (% of reports); adapted from [10].

Fraud committed against individuals aged 80 and older through online contact as opposed to other forms of contact, as a percentage of the total fraud reported to the FTC for this age group, has surged rapidly since the onset of COVID-19. The percentage of online contact-related fraud increased from 24% in 2019 to 34% in 2020 and 40% by 2022 [38]. This trend demonstrates that online contact is quickly supplanting phone contact as the primary method of targeting the oldest age group, with the remaining percentage representing the share of fraud committed through non-online modes of contact.

## 2.6. Types of Privacy and Data Safety Violations Most Relevant to Older Adults

The types of online scams notable for their prevalence or riskiness for older adults include romance scams, technical support scams, friends and family impersonation, business impersonation, and fake prize opportunities [39]. The FTC finds that older adults report higher fraud loss amounts than younger adults, with the highest median losses found among those aged 80 and older [39].

### 2.6.1. Romance Scams

Online affection-based scams exploit internet anonymity to build false intimacy over time, often lasting 6–8 months [40]. The perpetrators manipulate their victims into sending money to address fabricated emergencies or fund anticipated in-person meetings and may gather personal information to access bank accounts, credit cards, or email accounts [41]. Malware embedded in images or other files, which the recipient perceives as coming from a trusted source, can enable unauthorized access to personal information [42]. This type of scam causes the greatest financial loss to older adults [39]. During the pandemic, the FTC observed accelerations in the incidence and financial losses to older adults from romance scams [41].

### 2.6.2. Technical Support Impersonation Scams

These scams disproportionately target naïve computer users, particularly older adults [43]. Typically, the victim is directed to a website that claims a virus or other issue is detected on their computer and is encouraged to call a provided support line phone number. The “support technician” requests control of their machine to “resolve” the problem, enabling several avenues of fraud, such as offering paid services to address fake issues, uploading malware to ransom data, and/or uploading keystroke logging software to secretly capture personal financial information [44].

### 2.6.3. Friends and Family Impersonation Scams

Scammers can take advantage of internet anonymity and/or cognitive decline to impersonate someone familiar to the victim [45]. They often initiate contact by phone, using contact information legally acquired from data brokers, obituaries, or social media. To enhance their chances of successful impersonation, fraudsters may even purchase lists of individuals with dementia [46]. The “grandparent scam” serves as a common example, where perpetrators call older adults while pretending to be their grandchild. Upon finding a susceptible victim, they urgently request money to help with a fabricated emergency, such as being released from a foreign jail [46].

### 2.6.4. Business Impersonation Scams

This wide-ranging category of fraud is classified as consumer products and services fraud in the fraud taxonomy developed by Stanford’s Center on Longevity [47]. It encompasses various activities, such as phishing attempts, worthless products, and non-existent services. Business impersonation scams constitute one of the largest drivers of financial loss among older adults [39].

### 2.6.5. Prize and Sweepstakes Scams

In prize-related scams, scammers contact victims via phone or the internet, claiming they have “won” or become entitled to cash or a valuable item. This category includes fraudulent sweepstakes that were never entered, unexpected inheritances, and the infamous Nigerian prince who needs assistance in transferring money. In each case, an administrative fee and/or personal information, such as bank account details, are needed to “release” the funds [47].

### 3. Methodology

#### 3.1. Literature Search

A literature search was carried out by searching targeted databases using consistent search terms, complemented by citation tracing to identify additional related articles. The resulting themes and prioritization were confirmed through discussions with aging experts familiar with older adult populations that exhibit greater vulnerability.

Relevant articles were identified through searches on Scopus, PubMed, Web of Science, AgeLine (EBSCO), SocINDEX (EBSCO), and the University of North Texas Libraries Online Articles database, with a focus on peer-reviewed articles available as full text online. Search terms were employed to locate articles encompassing four topics: older adults, data privacy and safety, online activity, and the COVID-19 pandemic (see Table 1). The abstracts or the full text were reviewed to identify elements related to the privacy and data safety experiences of older adults who were drawn to or compelled toward new or increased online activity due to COVID-19. Figure 3 provides a graphical representation of the identification and screening process.

**Table 1.** Search terms.

Concept	Boolean Relationship <sup>1</sup>	Terms
Older adults	AND	"older adult*" OR "older pe*" OR "old age" OR "seniors" OR "senior citizen*" OR "elderly"
Data privacy and safety	AND	"priv*" OR "online safety" OR "cybersecurity" OR "data protection" OR "digital literacy" OR "fraud*" OR "scam*" OR "theft*" OR "financial abuse"
Online activity	AND	"internet" OR "online" OR "digital" OR "social media" OR "ICT" OR "information and communications technology"
COVID-19 pandemic	AND	"COVID*" OR "coronavirus*" OR "SARS-CoV-2" OR "2019-nCoV" OR "pandemic"

<sup>1</sup> An article identified in the database search must address each of the four concepts to be included. \* Denotes a wildcard character used in the search. Any number of characters, or no character, may take its place in results returned.

#### 3.2. Expert Consultation

Healthcare executives with expertise in the life experiences of more vulnerable middle-old and oldest-old individuals were consulted to examine the significance of QTIs and the gap in understanding the privacy and data safety implications of their rapid technology adoption. These experts brought valuable experience from various backgrounds, including managing a senior placement company assisting families in navigating senior living and care options, overseeing a medical home health company supporting older adults recovering from injury or illness, and leading hospice teams working primarily with older adults assessed by physicians to be within six months of passing. Each expert had extensive exposure to and interaction with older adults and their families in contexts involving the use or avoidance of technology for communication and other purposes.

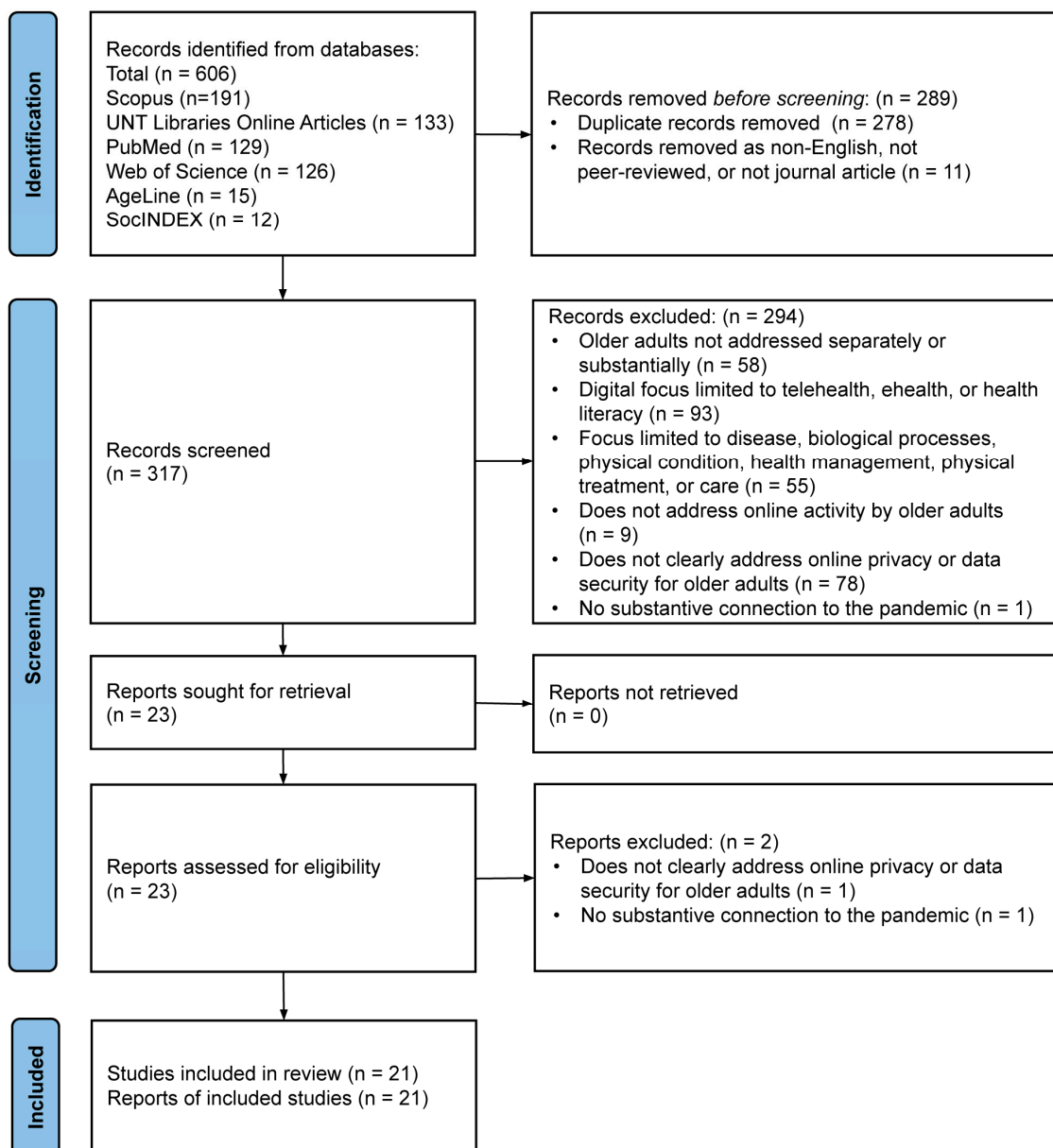


Figure 3. Identification of studies via databases [48].

#### 4. Discussion

##### 4.1. Expert Consultation and the Implications of Technology Adoption for Older Adults

The experts consulted offered insights into the implications of technology adoption for older adults with various risk factors, as summarized in Table 2. However, they also emphasized the diverse nature of older adults in terms of technology acceptance. As supported by the literature, technology adoption among older adults is highly individualized, with those resistant to adoption often having extremely low digital literacy levels. Consequently, experts anticipate that older adults forced into ICT adoption would fall into a higher-risk category concerning online privacy and data security, warranting special attention and protection. These insights were incorporated into the development of the search approach outlined in the methodology, which sought literature explicitly addressing these risk factors, and later in interpreting and prioritizing topical themes, as detailed in Table 3. Additionally, the experts consistently agreed that technology-hesitant individuals within each cohort in Table 2 would benefit from increased online engagement but would also necessitate special consideration for the proficiency and data safety aspects of digital literacy.

**Table 2.** Implications of technology adoption for older adults during COVID-19—insights from aging experts.

Expertise	Older Adult Cohort <sup>1</sup>	Technology Adoption Implications of COVID-19
Senior living (placement agency owner)	Independent living and assisted living residents; community-resident older adults considering senior living (middle-old, oldest-old).	Community-resident older adults introduced to technology by family or aging-in-place organizations, such as senior centers. Best positioned for online privacy and safety education.
Medical home health (regional director)	Patients recovering following injury or illness (middle-old, oldest-old).	Quarantine isolation compounded by injury or illness-driven isolation, increasing incentives to adopt ICT. Physical injury or illness frequently exacerbates cognitive challenges.
Hospice (program and operations director)	Last 6 months of life (oldest-old) [49].	Greatest support required for adoption/use of new technology; lowest awareness of online safety.

<sup>1</sup> Cohorts are arranged in an approximate ascending order based on the physical and/or cognitive challenges they face when adopting ICT. The middle-old group includes individuals aged 75–84, while the oldest-old category comprises those aged 85 and above [50].

**Table 3.** Older adults as quarantine technology initiates; prioritized topics based on the literature search; confirmed with aging experts.

ICT Adoption and Use Topics	Description
Adoption pressures	Influence of quarantine isolation on ICT adoption.
Adoption barriers	Factors driving or exacerbating adoption resistance by older adults.
Risks	Most common and highest cost types of privacy and data safety risks for older adults.
Vulnerabilities	Factors driving or exacerbating privacy and data safety violations against older adults.
Solutions	Approaches or systems mitigating the likelihood or cost of privacy and data safety violations against older adults.

**4.2. COVID-19: A Catalyst for Technology Adoption and the Associated Risks in Older Adults**

COVID-19 quarantines isolated older adults and effectively pushed some into online vulnerability [51,52]. In addition to being more susceptible to the virus itself, quarantines had a disproportionate impact on older adults who were less accustomed to and comfortable with online communication and information-seeking [32,53]. While previous research has addressed the challenges experienced by older adults in adopting and using ICT, the exploration of barriers to adoption during the COVID-19 pandemic has been limited [54]. Some older adults are restricted in their use of ICT due to inexperience, inadequate equipment, or an insufficient internet service [55]. Furthermore, they may limit or avoid technology usage to mitigate concerns regarding security and privacy [56]. From 2019 to 2021, the proportion of U.S. adults over 65 who did not use the internet declined from 27% [57] to 25% [19,20]. This figure is overshadowed by the 69% of adults over 65 who consider themselves slow to adopt new technology [58].

In addition to increasing the vulnerability of older adults to existing privacy and data security risks, the pandemic introduced various COVID-themed frauds aimed at obtaining personal data [7]. Reports to the FTC of identity theft related to government benefits or government documents surged more than 10-fold in 2020 and 2021 compared to 2017 through 2019 [59]. Besides misappropriating unemployment or stimulus payments, these and associated scams may involve spreading misinformation, promising false cures, or selling overpriced protective equipment [39]. Adults over 65 are less likely to adopt new



safety precautions after identity theft [58] and may be less likely to report or seek help when victimized [28]. As of October 2021, over 70% of COVID-related fraud reported to the FDIC involved identity theft [60]. When older adults fall for a specific scam, their personal information may be retained or sold for use in other fraud [28].

The surge in online activity caused by COVID-19 led to new privacy and data vulnerabilities that necessitated user education and protective measures. Xie et al. [2] discuss the challenges of forced technology adoption and recommend providing supportive services, including cybersecurity training, to safeguard privacy. Newlands et al. [61] examined how the hasty and compulsory adoption of online communication platforms, such as videoconferencing, created new privacy and data safety vulnerabilities for users. Taking Zoom as an example, the authors underscore the exposure of device, location, and IP data to hosts, the disclosure of personal information sent to Facebook, and the emergence of unwanted videoconference guests called Zoombombers.

#### 4.3. Characterization of Quarantine Technology Initiates and Their Online Privacy and Data Safety Risk Profiles

As reflected in Figure 3, our literature search identified only 21 articles that address the online privacy and data safety of older adults in the context of COVID-19. Moreover, achieving even this degree of topical coverage involved great international breadth, with studies focused on Australia, India, Italy, Malaysia, Mexico, Portugal, Singapore, the United Kingdom, and the United States individually represented. Of these, nine recognized not only that quarantines incited ICT adoption by older adults, but also that many of these adopters were technology novices overcoming their resistance to adoption [7,8,30,33,51,52,62–64]. These nine studies therefore explicitly or implicitly recognized the existence of those we refer to as QTIs. Older adults, especially those new to digital technology during the COVID-19 pandemic, are described as vulnerable to online privacy and data safety risks, including identity theft [63,65], data security breaches [6,7,31,33], scams [6,7,11,26,27,30,34,52,64], and other fraud [51]. Several articles specifically addressed mobile banking, including the perceived versus real risks of fraud, such as identity theft and data breaches [63,65,66]. Additionally, multiple articles highlight an increase in cybercrime targeting older adults, with online fraud rates rising significantly during the pandemic [6,7]. One article, by Recuperero, went as far as to highlight the limited research on technology-related risk factors correlated with financial abuse and claimed that these factors are likely to evolve over time, but stopped short of naming forced technology adoption as one of those potential risk factors [67].

Each included article identified in the literature search, however, associated these risks with some combination of digital literacy, online safety awareness, and inexperience correlated with age and indistinct from the risk profiles of older adults who adopted ICT before or independent of COVID-19 quarantines (see Table 4). For example, Buil-Gil and Zeng evaluated the incidence of U.K. romance scams by age, finding quarantine increases in every age group and for both men and women, with the percentage changes increasing by age within the oldest cohorts (60 s = +13.6%, 70 s = 17.6%, 80+ = 35.7%), although without statistical significance above the age of 60.

**Table 4.** Characterization of privacy and data safety risks of older adults by the included articles.

Characterization of Privacy and Data Safety Risks	Number of Included Articles	Percentage of Included Articles
Risk profile of older adults distinguished from younger persons	21	100%
QTIs not recognized	13	57.1%
QTIs recognized	9	42.9%
Risk profile of QTIs distinguished from other older adult ICT adoptees	0	0.0%

The most nuanced treatment of risk was found in Nolte et al.'s article, "Susceptibility to COVID-19 Scams: The Roles of Age, Individual Difference Measures, and Scam-Related Perceptions" [11]. The authors emphasize the importance of "individual differences" correlated with vulnerability to scams, such as impulsivity, skepticism toward advertising, and experience with fraud, and convincingly conclude that the relationship between age and fraud is complex. However, despite this encouragement of nuance, no evaluation or distinction of the risk profiles of QTIs was performed. The implication for risk was therefore consistent with the other articles included in the review: COVID-19 led more older adults to adopt ICT; therefore, these new adoptees are subject to risk in the same ways and to the same extent as other older adult adoptees.

The literature discusses a range of influential factors and potential solutions for these risks, from models, such as the Information Security Awareness Model (ISACM) and the Situation Awareness Cybersecurity Education Model (SAOCE), to methods of digital literacy assessment [6,25]. It also highlights the various causes of this increased risk, including lower levels of awareness and caution regarding online activities [8,11]. The breadth of the literature underscores the multifaceted nature of the issue, including the diverse array of risks facing QTIs and the need for comprehensive and adaptable solutions.

#### *4.4. Strategies to Mitigate Privacy and Data Safety Risks among Older Adults in the Context of COVID-19*

Although none of the included studies distinguished between mitigation strategies for QTIs and those for other older adults, they did represent a survey of intervention strategies and perspectives found in the limited corpus of works that address online privacy and data safety for older adults in the context of COVID-19. They address the increasing sophistication of scams [68] and the vulnerabilities of older technology users and argue that mitigation or protective efforts must be carefully designed. The World Health Organization's "Age Friendly City" initiative promotes safe and accurate communication channels accessible to older adults and communication technologies tailored for this demographic to help reduce harmful online experiences [69]. Several protective services and agencies offer resources to report fraud, educate consumers about financial and data safety, and provide information to law enforcement agents [39]. These include national organizations, such as the FTC and FBI, as well as regional "Better Business Bureaus", which all serve as consumer advocates in the fight against fraud.

The online monitoring of financial transactions can alert users to suspicious activity and even detect a decline in financial competence. A study by Wild et al. [70] found a significant negative correlation ( $p = 0.03$ ) between a simplified measure of financial capacity and the number of automated alerts triggered on older adult participants' financial transactions. This expands on recent research that successfully linked the type, frequency, and duration of computer usage with mild cognitive impairment [71].

International efforts toward privacy and data safety, such as the European Union's General Data Protection Regulation (GDPR) introduced in 2018, provide potential models for the United States. GDPR protects personal information and empowers users to maintain control over their data [8], whereas in the US consumer privacy predominantly falls under the management of private commercial interests and restricted state-level initiatives, such as the California Consumer Privacy Act [72]. GDPR builds on the earlier EU foundation of the Digital Single Market, which established mandates for privacy and personal data protection supported by international standardization [73].

Sen et al. [4], in their systematic review of digital technology usage by older adults from a well-being perspective, emphasize the importance of long-term, community-level educational efforts to safely equip older adults with new technologies (see also [62,74]). Ray [22], in his study of ICT adoption by older adults in response to COVID-19, suggested that poor usability hindered appropriate privacy practices. However, improved usability could lead to safer practices.

Moreover, the role of government initiatives and community support, such as local libraries offering digital literacy training, has been recognized as valuable in these mitigation efforts [62,75]. In addition, certain risk mitigation strategies, such as the GDPR and Digital Single Market initiatives in the European Union, could be adapted to protect QTIs more effectively in other regions [8]. This signifies the importance of a concerted, global effort to safeguard QTIs as their use of digital technology continues to rise in the aftermath of the COVID-19 pandemic, which supports the need to explore the online safety implications for this specific cohort.

#### 4.5. Reflections and Contributions

Older adults represent a distinct yet heterogeneous group of information and communication technology (ICT) users. The COVID-19 pandemic exacerbated the existing crisis of social disconnectedness among older adults [21] while simultaneously encouraging their adoption of social engagement technology, particularly videoconferencing [1,2]. This technology adoption exposed vulnerable and targeted age cohorts to online privacy violations and data theft. Romance scams, technical support scams, friends and family impersonation, business impersonation, and fraudulent prize opportunities particularly target older adults [39].

This study highlights the gap in the literature concerning increased privacy and data security risks for older adults who adopted technology due to isolation during the pandemic. Little work has been carried out to articulate or measure the distinct privacy and data safety risks and consequences experienced by those who adopted ICT reluctantly or without a sense of preparedness. An opportunity exists for new primary research that leverages the natural experiment provided by COVID-19 to identify and evaluate this vulnerable group of hesitant ICT adopters. The approaches to the mitigation of privacy risks identified in the included studies were not distinguished for QTIs from approaches for other older adults and comprised various educational strategies, automated financial transaction monitoring [70], and the application of international models, such as Europe's General Data Protection Regulation (GDPR) and the Digital Single Market (DSM) [8].

#### 4.6. Limitations

The limitations of this study include the necessity to prioritize certain databases over others, which could result in omissions in the works reviewed. This was mitigated by expanding the databases included until the additional results reflected the diminishing returns. Topical citation tracing further mitigated this limitation by allowing the consideration of additional relevant works. Additionally, the heterogeneity of older adults in terms of digital literacy impacts online privacy and data security in ways that are mentioned, but not fully explored, by the thin literature addressing this concept within the context of pandemic-driven technology adoption. This may limit the generalizability of key themes within the broader cohort of older adults, but also points to opportunities for novel primary research. Finally, this study may not fully reflect regional or cross-cultural differences. This is mitigated by the citation of studies from multiple countries that reflect common themes and could serve as a first step toward a larger study evaluating themes by cultural or geographic groupings.

### 5. Future Directions

Although multiple sources identify older adults going online in response to COVID as at risk of privacy and data abuse [28,39], we identified only one [22] that identified quarantine technology initiatives as a focus for research. The increased vulnerability of this cohort subsegment underscores the importance of addressing the privacy and data safety implications of the increased online activity of older adults during the COVID-19 pandemic. This leaves both the need and opportunity for studies that explore the differences between these initiatives and other older adults who are using familiar relational technology in familiar ways or who did not feel pressed into adoption. An understanding of how the

characteristics of these pragmatic adopters correlate with privacy and data security risks could inform protective programs, as well as technology adoption efforts focused on older adults. This opportunity should include an intersectional analysis of gender, race, and sexuality distinctions, as well as of the interactions among age sub-cohorts and fraud type. Future research should examine the primary data on privacy and data safety implications of hesitant ICT adoption by older adults using COVID-19 as a natural experiment to identify and evaluate this vulnerable group.

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