




Review Article

Online Misinformation against Older Adults During the COVID-19 Pandemic: A Brief Overview

Hossein Matlabi^{1,2}, Hamid Allahverdipour^{3,4}, Amir Ahmadi^{1,2*} 

¹. Department of Geriatric Health, Faculty of Health Sciences, Tabriz University of Medical Sciences, Tabriz, Iran

². Research Center for Integrative Medicine in Aging, Aging Research Institute, Tabriz University of Medical Sciences, Tabriz, Iran

³. Department of Health Education and Promotion, Faculty of Health Sciences, Tabriz University of Medical Sciences, Tabriz, Iran

⁴. Clinical Psychiatry Research Center, Tabriz University of Medical Sciences, Tabriz, Iran

* **Corresponding Author:** Department of Geriatric Health, Faculty of Health Sciences, Tabriz University of Medical Sciences, Tabriz, Iran. **Tel:** +989053244332, **Email address:** amirahmadi2066@gmail.com

ABSTRACT

Article history

Received 26 Feb 2023

Accepted 24 Jun 2023

Lack of knowledge about COVID-19 and increased use of social networks contributed to the spread of misinformation about the disease in society, harming older adults' health. In this review, we define misinformation and its condition during the COVID-19 pandemic and provide an overview of the characteristics of older adults and the impact of misinformation on this demographic group.

Citation: Matlabi H, Allahverdipour H, Ahmadi A. Online misinformation against older adults during the Covid-19 pandemic: a brief overview. *Elderly Health Journal*. 2023; 9(1): 39-43.

Keywords: Aged, Covid-19, Misinformation, Pandemics

COVID-19 infodemic

The rapid spread of coronavirus worldwide and the declaration of COVID-19 as a pandemic led to physical and social distancing regulations. Therefore, people used social media to learn new information about the pandemic (1). Also, governments, news outlets, scientists, and researchers are increasingly using social media to share information (2). The internet and electronic media made information available to billions of people, even if they were in lockdown (3). Social media like Facebook, Instagram, Twitter, WhatsApp, and YouTube were primary sources for spreading information and news of the outbreak to the people in quarantine (4). Health authorities and policymakers could use the flexibility and inclusiveness of social media to increase people's adherence to safety measures and fight the spread of COVID-19 (5). Social media have been an essential

source of information during the pandemic, despite their significant potential for misinformation (6). Due to the impact of COVID-19 and the lack of information about it, health misinformation spread rapidly through social media (7). Dissemination of unreliable news and information is known globally as infodemic and this situation was recently described as "infodemic" by the World Health Organization (2). Although the use of social media has sped up data transmission, it has also spread misinformation (8).

Misinformation in the COVID era

Misinformation is false or partially false information spread intentionally or unintentionally (9). It is a tool for developing power, personal gain, or influencing beliefs (10) and is spread online and offline. Healthcare misinformation can lead

consumers to make biased decisions and behaviors (11). Medical practitioners from 79 countries ranked misinformation as one of the leading global health concerns (12). The COVID-19 pandemic has led to an explosion of misinformation worldwide (13). The level of misinformation in healthcare peaked drastically during the COVID-19 pandemic, with significant implications for public and individual health (14). The spread of misinformation on social media platforms is faster than the spread of COVID-19. Thousands of lives worldwide were put at risk by the massive flow of misinformation (2, 15). Misinformation may lead to panic, anxiety, and even inappropriate behavior, jeopardizing any efforts to manage COVID-19 (16). Twitter users who shared COVID-19 misinformation experienced an additional increase in anxiety, approximately two times higher than similar users who did not share misinformation (17). The spread of misinformation has resulted in serious medical consequences during the COVID-19 pandemic. For example, misinformation about using disinfectants and alcohol to prevent and treat COVID-19 caused many deaths and poisonings in Iran (18).

During the COVID-19 pandemic, people were most exposed to misinformation due to a lack of knowledge and unreliable resources. Also, due to audience-oriented social media platforms, misinformation spreads more rapidly than ever before (10). In contrast to print and broadcast media, which are subject to regulations to prevent the dissemination of false information and punish those who do so, online social media are not governed by such laws, and false information continues to circulate freely on these platforms for financial gain and audience attraction (19). Studies showed that over one-quarter of the most-viewed news on YouTube contained misinformation, such as vaccine discovery and decontextualization (20). Misinformation spreads more rapidly than factually accurate information on social media (21), and even brief exposure to such information can lead to long-lasting changes in attitude and behavior (22, 23). Misinformation concerning COVID-19 included conspiracy theories, nonscientific treatment advice, the identification of virus characteristics, particular individuals' immunity, and vaccine side effects (24-26). Misinformation is essential in undermining mental health by inducing fear, stress, and anxiety (2, 10). Evidence shows that people who experience negative emotions when confronted with COVID-19 misinformation are more likely to believe and spread it (27).

The effect of online misinformation (infodemic) on older adults

In parallel with population aging and the digitization of societies, the number of older adults who use the Internet and who may do so in the future is growing (28). Even though older people started using the Internet later than younger people, their

usage is increasing rapidly as computers and the Internet become more accessible to them (29). They have more access to social media and the Internet than ever before and have become one of the main audiences for online health information (30). Many older adults are relatively new to social media. Fear and curiosity among older people living in isolation during the COVID era led them to seek information through different media platforms (10), and the ubiquity and popularity of social media platforms led to the widespread use of these media by older adults during the pandemic (31). The use of online social media by older adults could temporarily substitute physical contact in times of the COVID-19 pandemic and prevent or reduce feelings of social isolation or loneliness (32). The use of social media helps older adults cope with stress, alleviate social loneliness, and mitigate the adverse effects of the COVID-19 pandemic on their mental health. However, social media can act as a "double-edged sword" (33).

Misinformation, rumors, and negative emotions such as hopelessness, fear, and anxiety may spread on social media and have a negative impact on older adults' mental health as a vulnerable group (34, 35). Studies showed that older people who rely on social media or web pages to find out about COVID-19 are more likely to have a negative attitude toward vaccination, and it seems that misinformation is one of the main reasons for this issue (36). Older adults were often confused about the validity of online content related to COVID-19 cure and prevention (37). Older adults are also more likely to believe false news when exposed to the misinformation paradigm (30, 38). Researchers found that some personal qualities, including greater interpersonal trust, difficulty detecting lies, and cognitive problems, are all related to older adults' vulnerability to misinformation (39, 40). Other studies showed that in addition to the susceptibility to online misinformation, older adults are more likely to share misinformation through social media platforms such as Facebook, with over 65-year-olds sharing nearly seven times more fake news articles than younger users (41). Cohen et al. found that older adults were more vulnerable to misinformation and more confident that their wrong memory was correct (42). Cognitive declines, social changes, and digital illiteracy are three possible reasons older adults engage more frequently with misinformation. In addition, older adults may have trouble distinguishing between reliable news sources, advertising (vs. editorial) content, and manipulated online photos (39), so the ability to distinguish real from fake photos declines with age (43). Some cognitive processes, such as episodic memory and reasoning, decline with age, impairing the older person's ability to distinguish between true and false information (44, 45). In response to health misinformation, older adults may follow the "better safe than sorry" principle, that is to say, older adults prefer to trust the misinformation rather than doubt it to avoid health risks (46).

The role of eHealth literacy

Older adults are new to online social media, resulting in a digital divide (39). EHealth literacy is a combination of health literacy and media literacy. It means that a person can find, understand, and evaluate health information from electronic sources and make informed health decisions in everyday life about addressing health problems (47). Older adults are more likely to suffer from health problems than young adults, so eHealth literacy may particularly benefit them (48). During the pandemic, eHealth literacy is vital because people search and process COVID-19-related health information from social media and the Internet, and it plays an essential role in people's preventive efforts (49). The large volume of information and messages about COVID-19 is a challenge for e-health literacy (50).

In older adults, eHealth literacy is diverse by socio-demographic factors such as race, location, and culture. The level of eHealth literacy varies across countries, contents, strategies, training tools, and manuals of eHealth literacy interventions (51). Older adults experience low eHealth literacy because they are new to online social media (52-54). The low level of eHealth literacy in older adults can limit their use of technology, which leads to avoiding its use (55). Also, a low level of eHealth literacy contributes directly to the spread of false information about COVID-19 online (13). Studies showed that COVID-19 protective behaviors have statistically significant associations with eHealth literacy (56). High eHealth literacy decreases the likelihood of individuals trusting misleading health information, which leads to correct decisions (57).

Conclusions and guidance for future studies

People were especially exposed to misinformation during the COVID-19 pandemic due to a lack of awareness about the disease and the increased use of social media. Misinformation has hindered public-health efforts, from vaccination uptake to public compliance with health-protective practices (58). Although misinformation is available to anybody, it can be especially harmful to older adults. This issue will likely worsen in the future because of the expanding population of older people, the widespread availability of social media, and the rising interest of this demographic in using these platforms. According to psychological studies, older adults are more susceptible to misinformation and have greater confidence in false memories than younger adults (58, 59). Future research should examine how older adults evaluate true and false information across online social networks to equip them better to confront misinformation. Designing interventions to protect and empower older adults against misinformation, especially in emergencies, is essential. Health science researchers, especially psychologists and gerontologists, can help with research in this field with the cooperation of social media science experts.

Ethics approval

This is a report of the database from a PhD thesis registered at Tabriz University of Medical Sciences with ethics approval (IR.TBZMED.REC.1401.349).

Conflict of interest

The authors have no competing interests to declare.

Acknowledgments

We would like to express our gratitude to the members of the department of Geriatric Health at Tabriz University of Medical Sciences for their valuable support.

Authors' contributions

All authors have made substantial contributions to the conception or design of the work, drafting the work and revising it critically for important intellectual content; they have given final approval of the version to be published, and they are in agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

References

1. Gottlieb M, Dyer S. Information and disinformation: social media in the COVID-19 crisis. *Academic Emergency Medicine*. 2020; 27(7): 640-1.
2. Zarocostas J. How to fight an infodemic. *The Lancet*. 2020; 395(10225): 676.
3. Sasidharan S, Harpreet Singh D, Vijay S, Manalikuzhiyil B. COVID-19: pan(info)demic. *Turkish Journal of Anaesthesiology and Reanimation*. 2020; 48(6): 438-42.
4. Tsao SF, Chen H, Tisseverasinghe T, Yang Y, Li L, Butt ZA. What social media told us in the time of COVID-19: a scoping review. *The Lancet Digital Health*. 2021; 3(3): e175-e94.
5. Hussain W. Role of social media in COVID-19 pandemic. *The International Journal of Frontier Sciences*. 2020; 4(2):59-60.
6. Gupta L, Gasparyan AY, Misra DP, Agarwal V, Zimba O, Yessirkepov M. Information and misinformation on COVID-19: a cross-sectional survey study. *Journal of Korean Medical Science*. 2020; 35(27): 1-11.
7. Chen K, Luo Y, Hu A, Zhao J, Zhang L. Characteristics of misinformation spreading on social media during the COVID-19 outbreak in China: a descriptive analysis. *Risk Management and Healthcare Policy*. 2021; 14: 1869-79.
8. Soto-Perez-de-Celis E. Social media, ageism, and older adults during the COVID-19 pandemic. *EClinical Medicine*. 2020; 29-30(2020): 1-3.

9. O'Connor C, Weatherall JO. The misinformation age: How false beliefs spread. Yale University Press; 2019.
10. Ali S. Combatting against Covid-19 & misinformation: A systematic review. *Human Arenas*. 2022; 5(2):337-52.
11. Kata A. A postmodern Pandora's box: anti-vaccination misinformation on the Internet. *Vaccine*. 2010; 28(7): 1709-16.
12. Naeem SB, Bhatti R, Khan A. An exploration of how fake news is taking over social media and putting public health at risk. *Health Information and Libraries Journal*. 2021;38(2):143-9.
13. Bin Naeem S, Kamel Boulos MN. COVID-19 misinformation online and health literacy: a brief overview. *International Journal of Environmental Research and Public Health*. 2021; 18(15): 1-12.
14. Gabarron E, Oyeyemi SO, Wynn R. COVID-19-related misinformation on social media: a systematic review. *Bulletin of the World Health Organization*. 2021; 99(6): 455-63.
15. Barua Z, Barua S, Aktar S, Kabir N, Li M. Effects of misinformation on COVID-19 individual responses and recommendations for resilience of disastrous consequences of misinformation. *Progress in Disaster Science*. 2020; 8:1-10.
16. Swire-Thompson B, Lazer D. Public health and online misinformation: challenges and recommendations. *Annual Review of Public Health*. 2019; 41: 433-51.
17. Verma G, Bhardwaj A, Aledavood T, De Choudhury M, Kumar S. Examining the impact of sharing COVID-19 misinformation online on mental health. *Scientific Reports*. 2022; 12(1): 1-9.
18. Hassanian-Moghaddam H, Zamani N, Kolahi A-A, McDonald R, Hovda KE. Double trouble: methanol outbreak in the wake of the COVID-19 pandemic in Iran—a cross-sectional assessment. *Critical Care*. 2020; 24(1): 1-3.
19. Brennen JS, Simon FM, Howard PN, Nielsen RK. Types, sources, and claims of COVID-19 misinformation: University of Oxford; 2020.
20. Li HO-Y, Bailey A, Huynh D, Chan J. YouTube as a source of information on COVID-19: a pandemic of misinformation?. *BMJ Global Health*. 2020; 5(5): 1-6.
21. Vosoughi S, Roy D, Aral S. The spread of true and false news online. *Science*. 2018; 359(6380): 1146-51.
22. Pluviano S, Watt C, Della Sala S. Misinformation lingers in memory: failure of three pro-vaccination strategies. *PloS One*. 2017; 12(7): 1-15.
23. Zhu B, Chen C, Loftus EF, He Q, Chen C, Lei X, et al. Brief exposure to misinformation can lead to long-term false memories. *Applied Cognitive Psychology*. 2012; 26(2): 301-7.
24. Douglas KM, Uscinski JE, Sutton RM, Cichocka A, Nefes T, Ang CS, et al. Understanding conspiracy theories. *Political Psychology*. 2019; 40(S1): 3-35.
25. Greenspan RL, Loftus EF. Pandemics and infodemics: research on the effects of misinformation on memory. *Human Behavior and Emerging Technologies*. 2021; 3(1):8-12.
26. Loomba S, de Figueiredo A, Piatek SJ, de Graaf K, Larson HJ. Measuring the impact of COVID-19 vaccine misinformation on vaccination intent in the UK and USA. *Nature Human Behaviour*. 2021; 5(3): 337-48.
27. Han J, Cha M, Lee W. Anger contributes to the spread of COVID-19 misinformation. *Harvard Kennedy School Misinformation Review*. 2020; 1: 1-14.
28. Hunsaker A, Hargittai E. A review of Internet use among older adults. *New Media & Society*. 2018; 20(10): 3937-54.
29. Marston HR, Genoe R, Freeman S, Kulczycki C, Musselwhite C. Older adults' perceptions of ICT: Main findings from the technology in later life (TILL) study. *Healthcare*. 2019; 7(3): 1-27.
30. Seo H, Blomberg M, Altschwager D, Vu HT. Vulnerable populations and misinformation: A mixed-methods approach to underserved older adults' online information assessment. *New Media & Society*. 2021; 23(7): 2012-33.
31. Cuan-Baltazar JY, Muñoz-Perez MJ, Robledo-Vega C, Pérez-Zepeda MF, Soto-Vega E. Misinformation of COVID-19 on the internet: infodemiology study. *JMIR Public Health and Surveillance*. 2020; 6(2): 18444.
32. Hajek A, König HH. Social Isolation and loneliness of older adults in times of the COVID-19 pandemic: can use of online social media sites and video chats assist in mitigating social isolation and loneliness?. *Gerontology*. 2021; 67(1): 121-4.
33. Yang X, Yip BHK, Mak ADP, Zhang D, Lee EKP, Wong SYS. The differential effects of social media on depressive symptoms and suicidal ideation among the younger and older adult population in Hong Kong during the COVID-19 pandemic: population-based cross-sectional survey study. *JMIR Public Health and Surveillance*. 2021; 7(5): 1-22.
34. Depoux A, Martin S, Karafillakis E, Preet R, Wilder-Smith A, Larson H. The pandemic of social media panic travels faster than the COVID-19 outbreak. *Journal of Travel Medicine*. 2020; 27(3): 1-4.
35. Kramer AD, Guillory JE, Hancock JT. Experimental evidence of massive-scale emotional contagion through social networks. *Proceedings of the National Academy of Sciences of the United States of America*. 2014; 111(24): 8788-90.
36. Bhagianadh D, Arora K. COVID-19 vaccine hesitancy among community-dwelling older adults: the role of information sources. *Journal of Applied Gerontology*. 2022; 41(1): 4-11.
37. Choudrie J, Banerjee S, Kotecha K, Walambe R, Karende H, Ameta J. Machine learning techniques and older adults processing of online information and misinformation: A covid 19 study. *Computers in Human Behavior*. 2021; 119: 1-11.
38. Roediger HL, Geraci L. Aging and the misinformation effect: A neuropsychological analysis. *Journal of Experimental Psychology: Learning, Memory, and Cognition*. 2007; 33(2): 321-34.

39. Brashier NM, Schacter DL. Aging in an era of fake news. *Current Directions in Psychological Science*. 2020; 29(3): 316-23.
40. Xiang H, Zhou J, Xie B, editors. Understanding older adults' vulnerability and reactions to telecommunication fraud: the effects of personality and cognition. *Proceedings of the 22nd International Conference on Human-Computer Interaction*; 2020 July 19-24; Denmark. Springer; 2020.
41. Guess A, Nagler J, Tucker J. Less than you think: Prevalence and predictors of fake news dissemination on Facebook. *Science Advances*. 2019; 5(1): 1-8.
42. Cohen G, Faulkner D. Age differences in source forgetting: effects on reality monitoring and on eyewitness testimony. *Psychology and Aging*. 1989; 4(1): 10-7.
43. Nightingale SJ, Wade KA, Watson DG. Can people identify original and manipulated photos of real-world scenes?. *Cognitive Research: Principles and Implications*. 2017; 2(30): 1-21.
44. Scherer LD, Pennycook G. Who is susceptible to online health misinformation? : American Public Health Association; 2020. p. S276-S7.
45. Salthouse TA. Trajectories of normal cognitive aging. *Psychology and Aging*. 2019; 34(1): 17-24.
46. Zhou J, Xiang H, Xie B. Better safe than sorry: a study on older adults' credibility judgments and spreading of health misinformation. *Universal Access in the Information Society*. 2022;1-10.
47. Norman CD, Skinner HA. eHealth literacy: essential skills for consumer health in a networked world. *Journal of Medical Internet Research*. 2006; 8(2): 1-12.
48. Chung SY, Nahm ES. Testing reliability and validity of the eHealth Literacy Scale (eHEALS) for older adults recruited online. *Computers, Informatics, Nursing: CIN*. 2015; 33(4): 150-6.
49. Abbaspur-Behbahani S, Monaghesh E, Hajizadeh A, Fehrest S. Application of mobile health to support the elderly during the COVID-19 outbreak: A systematic review. *Health Policy and Technology*. 2022; 11(1): 1-9.
50. Chong YY, Cheng HY, Chan HYL, Chien WT, Wong SYS. COVID-19 pandemic, infodemic and the role of eHealth literacy. *International Journal of Nursing Studies*. 2020; 108: 1-3.
51. Pourrazavi S, Kouzekanani K, Bazargan-Hejazi S, Shaghghi A, Hashemiparast M, Fathifar Z, et al. Theory-based E-health literacy interventions in older adults: a systematic review. *Archives of Public Health*. 2020; 78(2020): 1-8.
52. Arcury TA, Sandberg JC, Melius KP, Quandt SA, Leng X, Latulipe C, et al. Older adult internet use and eHealth literacy. *Journal of Applied Gerontology*. 2020; 39(2): 141-50.
53. Cherid C, Baghdadli A, Wall M, Mayo N, Berry G, Harvey E, et al. Current level of technology use, health and eHealth literacy in older Canadians with a recent fracture—a survey in orthopedic clinics. *Osteoporosis International*. 2020; 31(7): 1333-40.
54. Shi Y, Ma D, Zhang J, Chen B. In the digital age: a systematic literature review of the e-health literacy and influencing factors among Chinese older adults. *Journal of Public Health*. 2023; 31(5): 679-879.
55. Yoon H, Jang Y, Vaughan PW, Garcia M. Older adults' internet use for health information: digital divide by race/ethnicity and socioeconomic status. *Journal of Applied Gerontology*. 2020; 39(1): 105-10.
56. Rezakhani Moghaddam H, Ranjbaran S, Babazadeh T. The role of e-health literacy and some cognitive factors in adopting protective behaviors of COVID-19 in Khalkhal residents. *Frontiers in Public Health*. 2022; 10: 1-9.
57. Song S, Zhao Y, Song X, Zhu Q, editors. The role of health literacy on credibility judgment of online health misinformation. *Proceedings of the 2019 IEEE International Conference on Healthcare Informatics (ICHI)*; 2019 June 10-13; Xi'an, China. IEEE; 2019.
58. Wylie LE, Patihis L, McCuller LL, Davis D, Brank EM, Loftus EF, et al. Misinformation effect in older versus younger adults: A meta-analysis and review. *The Elderly Eyewitness in Court*. 2014; 2014: 38-66.
59. Jacoby LL, Rhodes MG. False remembering in the aged. *Current Directions in Psychological Science*. 2006; 15(2): 49-53.