

Concerns over the Spread of Misinformation and Fake News on Social Media—Challenges Amid the Coronavirus Pandemic [†]

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Abstract: The unfolding pandemic of COVID-19, also known as coronavirus, has caused challenges across the globe. Shelter-in-place, lockdown, and social distancing policies increased the use of social media for societies to stay connected. This study investigated the psychological issues societies experienced using social media in the community during this critical period. Cross-sectional online surveys were used to collect qualitative data from 1991 respondents living in the UK, USA, and Australia during April–May 2020 when the shelter-in-place or stay-at-home policies were in place. The study found that the spread of misinformation and conspiracy theories caused psychosocial challenges and disconnections in the community.

Keywords: misinformation; social media; mental health; coronavirus; pandemic

1. Introduction

The unfolding pandemic of COVID-19, also known as coronavirus, has caused challenges across the globe. Uncertainties of the situation and changes in the way we live with lockdown, shelter-in-place, and social distancing policies have generated stress and anxiety in people with psychological conditions as well as in healthy individuals [1].

The World Health Organization called for people to stay connected in contactless manners, such as by social media [2]. Trust in the government and the sense of unity when facing a shared threat may enhance mental resilience to facilitate coping with the crisis [3]. Social media provides an alternative form of human connection and communication when meeting physically is not possible. So far, no studies have found definite positive or negative effects from social media use [4]. When used in moderation, exposure to positive news on social media may enhance social connection and a greater sense of being part of a community [4,5]. However, users may also feel disconnected and experience negative emotions associated with concerns about judgement from others and envy. When used heavily, social media use is associated with greater emotional difficulties such as loneliness,

depressed mood, tearfulness, and anxiety [6–9]. However, some of these studies were conducted among adolescents, which limits the generalizability of the results.

Moreover, COVID is a unique situation: a contagious disease that affects everybody. The disease spreads quickly and could be fatal. It has completely changed the way we socialize which many people find hard to adjust to. The situation has also been evolving constantly in terms of public health policies: lockdowns, social distancing, self-isolation, and a lot of people have had to rely on news media and social media platforms to keep track of the situation. The unique situation may have changed the amount of time we spend on social media, the information that we are exposed to, and the way we feel about the information we read online. Misinformation could fuel anxiety during this uncertain time. This phenomenon of misinformation and conspiracy theories, which were once considered minority thinking that has little impact on the real world, has had a stronger influence during the COVID-19 pandemic. For example, the 5G technology has been incorrectly stated as the reason for the spread of COVID-19. Internet searches relating to “5G technology” and “COVID-19” doubled within a week during March–April 2020 across different countries [10]. Searches for other conspiracy theories around how COVID-19 started, vaccination and forms of treatment have also increased significantly, which has consequently led to lower vaccination rates among some populations and lower trust in the government and public health recommendations [10,11].

Empirical evidence also found that rumours were three times more likely to be shared on social media than genuine health messages [12]. Too much screen time and use of social media in the context of COVID-19 were shown to be associated with poor mental health [13,14]. However, there has been a lack of qualitative information to understand what people think about social media use during the pandemic and how they feel about misinformation. To gain insight into the critical psychological issues that societies may be facing during the times of increased Internet use, the present study investigated qualitative data regarding personal experience of using social media across the USA, UK, and Australia.

2. Methods

2.1. Setting and Participants

The data were from a multi-country cross-sectional online survey conducted in April–May 2020 across Norway, USA, UK, and Australia. The data were collected when the stay-at-home policies were in place over a period of 3–4 weeks in each country.

The participants were invited to complete an online self-administered survey distributed via social media advertisements (Facebook, Instagram, and Twitter) and university networks across Norway, USA, UK, and Australia. The data landing sites were of OsloMet—Oslo Metropolitan University, Norway; University of Michigan, USA; University of Salford, UK; and the University of Queensland, Australia. The initiator of the project was AØG from OsloMet. All the countries and universities had a country-specific lead for the project, with ethical considerations and approvals. The project was approved by Oslo Metropolitan University and by the regional committee for medical and health research ethics (REK; project reference No. 132066) in Norway. Reviews and exemptions were obtained from the University of Michigan’s Institutional Review Board for Health Sciences and Behavioral Sciences (IRB HSBS) in the USA (HUM00180296), the University Health Research Ethics in the UK (HSR1920-080), and the University of Queensland’s Human Research Ethics Office in Australia (HSR1920-080).

2.2. Inclusion

The project’s inclusion criteria were for participants to be 18 years or older, understand Norwegian or English, and live in Norway, USA, UK, or Australia. We had initial responses from 3810 participants from Norway ($n = 771$), USA ($n = 1393$), UK ($n = 1373$), and Australia ($n = 273$). For the present analysis, the participants from Norway were excluded because the qualitative question required for this paper was not asked. From the USA, UK, and Australia, 1012 participants who did not answer the question or answered “none”, and 36

who provided an answer but not in response to the question (e.g., survey feedback) were excluded. Finally, responses from 1991 participants were included in the present article for qualitative analysis.

2.3. Measures

The participants were asked an open-ended question: “During this COVID-19 pandemic, what challenges have you experienced in using social media?”. The measure of interest for this study are comments related to concerns over misinformation, including expression and responses related to misinformation, conspiracy theories, fake news, and conflicting or nonscientific claims and information.

2.4. Analysis

The collected responses were reviewed by two researchers independently. Ninety-seven percent of the responses were coded consistently between the two reviewers. The responses were screened and sorted into three categories: (a) relevant to concerns over misinformation; (b) irrelevant to misinformation; and (c) invalid response (i.e., responses unrelated to the question asked or no response provided). All the valid responses were then independently coded by a second reviewer. Conflicted categories were discussed and resolved. The proportion of responses regarding concerns over misinformation were calculated for each country. Chi-squared tests were used to assess the significance of differences between the countries. The responses relevant to concerns over misinformation were qualitatively examined based on their content.

3. Results

We observed that concerns over misinformation and fake news were repetitively raised as a key challenge during the COVID-19 pandemic (see Figure 1). Overall, one in three respondents expressed concerns over misinformation as the key challenge, with a higher prevalence among respondents from the USA (41%) than from the UK (35%) and Australia (32%), $\chi^2(2) = 8.5, p = 0.015$.

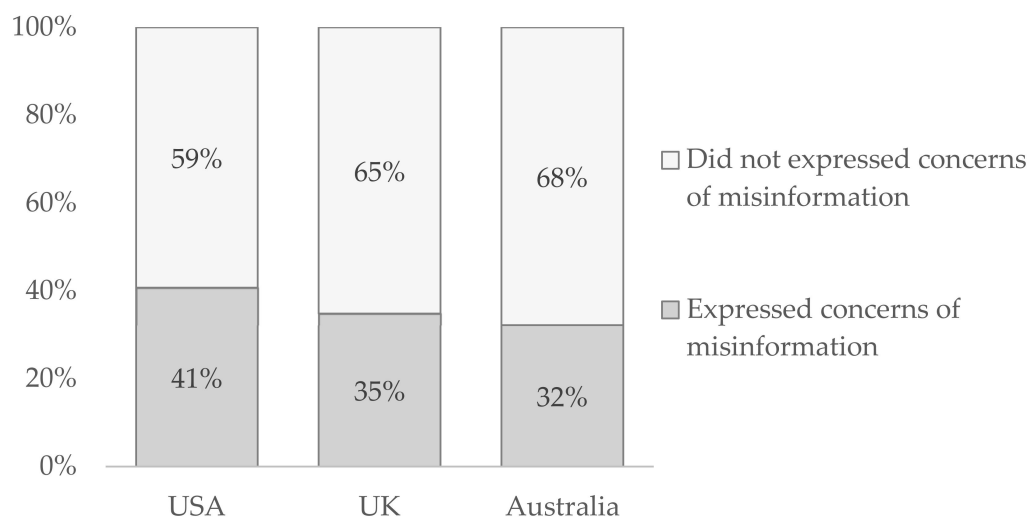


Figure 1. Proportion of participants who had expressed that concerns over misinformation and fake news was a challenge that they have experienced in using social media during the COVID-19 pandemic.

Many respondents expressed concerns and psychological distress over the amount of misinformation on social media. The respondents who mainly accessed information through sources that they considered trustworthy, such as only trusting information from official health channels, were less likely to express emotional distress. However, some who believe that they were not affected by misinformation themselves were worried about others

in the community believing in false information being spread over social media. Most of the participants commented that the vast amount of misinformation on social media was a stressor because it created confusion and difficulties for them to access accurate information. Example quotes:

There is a lot of fake news on social media and sometimes it is difficult to distinguish real news from fake news.

Sorting through misinformation and feeling stressed about spreading of false information
...

There were responses from both sides of the community—those who believed that the pandemic was not taken seriously enough, and those who believed the opposite. Both the people who trusted the health officials and the people who did not trust the health officials expressed negativity towards what they believed was false information. For example:

Feelings of frustration with misinformation from government officials, and people overblown the “pandemic”.

... It is difficult to watch people post about not taking the pandemic seriously and complaining about minor things when people are dying and putting their own lives on the line ...

Challenges in dealing with conflicting information and conspiracy theories were also commonly raised, as illustrated in the following example quotes:

Too much conflicting information, conspiracy theories and inappropriate trolling causing conflict between people.

Information on social media can be incorrect. People share conflicting articles. It can sometimes make you feel more isolated and apart from all your friends only seeing brief updates.

While social media was designed to facilitate social connections, it could conversely cause disconnection when false information is spread by others, including friends or family, causes conflicts, distancing, frustration, or arguments, for example:

Remaining neutral and not comment on posts that I think are outlandish. I don’t need to add to the mis-information but when I don’t agree at all, it’s hard not to react. My eyes have been opened to a side of a few people, that I was surprised existed. I have unfriended a few people and hidden many too.

I’ve culled or modified my Facebook friends list a bit. People can think whatever they want, but I’m not interested in their promotion of conspiracy theories or arguing with me about how safe my work place is or isn’t.

4. Discussion

Communication of accurate information to the public is particularly important during a crisis from an informational perspective [15]. From a psychological perspective, we found that the spread of misinformation is a critical societal issue during COVID-19. Our findings support that public health responses to pandemics need to integrate psychological strategies to address the mental health consequences [16]. Increased exposure to social media can negatively affect the mental health of the society [17]. Excessive exposure to media coverage of the coronavirus pandemic may heighten the sense of risk and induce acute stress responses, as seen in previous public health crises [18].

In the present study, many social media users expressed frustration about conflicting information (including information from government bodies, news outlets, information articles, and individual opinions) and misinformation surrounding the current COVID-19 outbreak. Users expressed frustration over difficulties in distinguishing genuine health messages from the large amount of “fake news” on social media. The previous study suggests that misinformation gets circulated faster because of higher engagement between users [12].

Previous studies claimed that the algorithms employed by social media platforms which prioritize popular posts based on user engagement might have helped spreading misinformation [19]. Our qualitative analysis revealed that this engagement might have been facilitated by users themselves trying to rectify the misinformation circulated among their social networks. Although users acknowledged that responding to misinformation would give it more public attention, they found it hard to hold back when their friends and families contributed to the spread of inaccurate information.

Conflicting information causes additional stress and anxiety and reduces public trust towards the government, which counters the efforts in public health communication [11]. Currently, authorities and government bodies are focused on concerns that incorrect health advice circulated on social media would harm the community directly (e.g., recommendation of drinking salt water or bleach as a cure for the coronavirus disease). However, our results revealed that some people also had doubts about the information and recommendations provided by the governments. This suggests that the governments' efforts to counter misinformation are insufficient.

Although some people managed to stay informed using social media, others said that differing opinions (referred to as fake news by the respondents) from friends and families put strains on relationships, which made them feel more isolated and exacerbated the distress. Insufficient social support and prolonged acute stress during the COVID-19 outbreak may cause adverse long-term mental health outcomes. Social isolation would also make it harder for people to return to regular personal contact when the shelter-in-place or lockdown periods are over. The American Psychological Association posted five tips for the public to manage their anxiety given the crisis, including a call for people to verify the information obtained from social media and keep connected and share useful information with friends and family [20]. Our findings indicated that in some instances, the sharing of information between friends and family led to interpersonal conflicts when people disagreed upon the truth. Shared family beliefs foster relationships and provide positive psychology in times of stress and uncertainties [21]. However, access to different sources of information from social media may have increased the divergence of opinions between family members.

The following are the key limitations of our observations. Our data are cross-sectional, and we do not know if the respondents had faced challenges with misinformation before the COVID-19 pandemic for comparison. A third of the participants had not answered the open-ended qualitative question to enable analysis. It was unclear whether they did not respond due to not having faced any challenges, did not want to answer an open-ended question (last item as part of a larger survey). Prevalence of participants expressing concerns over misinformation on social media may have differed if we had collected information on this as a yes/no item. Future research is warranted to collect quantitative data and further explore psychosocial interventions that could buffer the impacts of misinformation.

5. Implications

Social media can be beneficial in connecting people and can effectively deliver important messages. However, in the context of the COVID-19 outbreak, the fueling of misinformation has added more stress and confusion to social media users. Being able to identify accurate or reliable sources of information may help alleviate the issues. Some social network platforms such as Twitter started labelling disputed information on their platforms since March 2020. Further investigation is needed to assess the effectiveness of such measures on the information presented on social media and how that may affect the mental well-being of social media users.

During times of uncertainty, people may want to gain better understanding of the situation through "real people" outside of the official communication channel, hence the increased use of social media. Therefore, governments and health organizations may consider innovative strategies such as collaboration with "influencers" to help articulate health messages to a more diverse population (e.g., people of diverse ages, genders, and

ethnicities). Tailor-made materials would also enhance effective communication of health information for people with different needs (e.g., individuals and caretakers of children and elderly).

It is evident that in addition to providing tips to the society about strategies that can be used to obtain accurate information, we urgently need psychosocial and interpersonal strategies on how to maintain a supportive relationship with the family and friends who may have a different opinion. A crisis-specific module to address psychosocial issues arising from the spread of misinformation on social media is warranted for the continued efforts of health service psychology education and training [22]. Mental health professionals need to consider how to support people in the community who may benefit from help to rebuild and strengthen interpersonal relationships in response to the potential increased psychosocial challenges during and after the crisis.

6. Conclusions

We observed that the spread of misinformation, conspiracy theories, and fake news on social media during the COVID-19 pandemic has been a critical societal issue faced by the public across the USA, UK, and Australia. The spread of misinformation has caused psychosocial challenges and disconnections in the society. The vast amount of misinformation creates confusion and leads to distress and frustration. As part of our public health response in countering misinformation, we need to invest in strategies to address psychosocial consequences. There is an urgent need to address the spread of misinformation from a psychological perspective during the current and future crises.

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Informed Consent Statement: The researchers followed all relevant regulations concerning ethics and data collection and protection. The data collected from the respondents were anonymous.

Data Availability Statement: The dataset analyzed for this study will be available from Oslo Metropolitan University on request after the completion of the study. E-mail: amyoye@oslomet.no.

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References

1. Shigemura, J.; Ursano, R.J.; Morganstein, J.C.; Kurosawa, M.; Benedek, D.M. Public responses to the novel 2019 coronavirus (2019-nCoV) in Japan: Mental health consequences and target populations. *Psychiatry Clin. Neurosci.* **2020**, *74*, 281–282. [[CrossRef](#)] [[PubMed](#)]
2. World Health Organization. *Mental Health and Psychosocial Considerations during the COVID-19 Outbreak*, 18 March 2020; World Health Organization: Geneva, Switzerland, 2020.
3. Sibley, C.G.; Greaves, L.M.; Satherley, N.; Wilson, M.S.; Overall, N.C.; Lee, C.H.J.; Milojev, P.; Bulbulia, J.; Osborne, D.; Milfont, T.L.; et al. Effects of the COVID-19 Pandemic and Nationwide Lockdown on Trust, Attitudes Toward Government, and Well-Being. *Am. Psychol.* **2020**, *75*, 618–630. [[CrossRef](#)] [[PubMed](#)]
4. McCrory, A.; Best, P.; Maddock, A. The relationship between highly visual social media and young people's mental health: A scoping review. *Child. Youth Serv. Rev.* **2020**, *115*, 105053. [[CrossRef](#)]
5. Shekhar, S.K. Social media, positive news give hope amid pandemic in India. *Media Asia* **2021**, *48*, 368–371. [[CrossRef](#)]

6. Hunt, M.G.; Marx, R.; Lipson, C.; Young, J. No More FOMO: Limiting Social Media Decreases Loneliness and Depression. *J. Soc. Clin. Psychol.* **2018**, *37*, 751–768. [\[CrossRef\]](#)
7. O'Day, E.B.; Heimberg, R.G. Social media use, social anxiety, and loneliness: A systematic review. *Comput. Hum. Behav. Rep.* **2021**, *3*, 100070. [\[CrossRef\]](#)
8. Banerjee, D.; Meena, K.S. COVID-19 as an “Infodemic” in Public Health: Critical Role of the Social Media. *Front. Public Health* **2021**, *9*, 231. [\[CrossRef\]](#) [\[PubMed\]](#)
9. Islam, M.S.; Sujon, S.H.; Tasnim, R.; Mohona, R.A.; Ferdouz, M.Z.; Kamruzzaman, S.; Toma, T.Y.; Sakib, N.; Pinky, K.N.; Islam, R.; et al. Problematic Smartphone and Social Media Use Among Bangladeshi College and University Students Amid COVID-19: The Role of Psychological Well-Being and Pandemic Related Factors. *Front. Psychiatry* **2021**, *12*, 647386. [\[CrossRef\]](#) [\[PubMed\]](#)
10. Nsoesie, E.O.; Cesare, N.; Müller, M.; Ozonoff, A. COVID-19 Misinformation Spread in Eight Countries: Exponential Growth Modeling Study. *J. Med. Internet Res.* **2020**, *22*, e24425. [\[CrossRef\]](#) [\[PubMed\]](#)
11. De Coninck, D.; Frissen, T.; Matthijs, K.; d’Haenens, L.; Lits, G.; Champagne-Poirier, O.; Carignan, N.-E.; David, M.C.; Pignard-Cheynel, N.; Salerno, S.; et al. Beliefs in Conspiracy Theories and Misinformation About COVID-19: Comparative Perspectives on the Role of Anxiety, Depression and Exposure to and Trust in Information Sources. *Front. Psychol.* **2021**, *12*, 646394. [\[CrossRef\]](#) [\[PubMed\]](#)
12. Sommariva, S.; Vamos, C.; Mantzarlis, A.; Uyên-Loan Đào, L.; Martinez Tyson, D. Spreading the (Fake) News: Exploring Health Messages on Social Media and the Implications for Health Professionals Using a Case Study. *Am. J. Health Educ.* **2018**, *49*, 246–255. [\[CrossRef\]](#)
13. Wong, F.H.C.; Liu, T.; Leung, D.K.Y.; Zhang, A.Y.; Au, W.S.H.; Kwok, W.W.; Shum, A.K.Y.; Wong, G.H.Y.; Lum, T.Y.-S. Consuming Information Related to COVID-19 on Social Media Among Older Adults and Its Association With Anxiety, Social Trust in Information, and COVID-Safe Behaviors: Cross-Sectional Telephone Survey. *J. Med. Internet Res.* **2021**, *23*, e26570. [\[CrossRef\]](#) [\[PubMed\]](#)
14. Thygesen, H.; Bonsaksen, T.; Schoultz, M.; Ruffolo, M.; Leung, J.; Price, D.; Geirdal, A.Ø. Social Media Use and Its Associations with Mental Health 9 Months after the COVID-19 Outbreak: A Cross-National Study. *Front. Public Health* **2022**, *9*, 752004. [\[CrossRef\]](#) [\[PubMed\]](#)
15. Bavel, J.J.V.; Baicker, K.; Boggio, P.S.; Capraro, V.; Cichocka, A.; Cikara, M.; Crockett, M.J.; Crum, A.J.; Douglas, K.M.; Druckman, J.N.; et al. Using social and behavioural science to support COVID-19 pandemic response. *Nat. Hum. Behav.* **2020**, *4*, 460. [\[CrossRef\]](#) [\[PubMed\]](#)
16. Kaslow, N.J.; Friis-Healy, E.A.; Cattie, J.E.; Cook, S.C.; Crowell, A.L.; Cullum, K.A.; del Rio, C.; Marshall-Lee, E.D.; LoPilato, A.M.; VanderBroek-Stice, L.; et al. Flattening the emotional distress curve: A behavioral health pandemic response strategy for COVID-19. *Am. Psychol.* **2020**, *75*, 875–886. [\[CrossRef\]](#) [\[PubMed\]](#)
17. Primack, B.A.; Shensa, A.; Escobar-Viera, C.G.; Barrett, E.L.; Sidani, J.E.; Colditz, J.B.; James, A.E. Use of multiple social media platforms and symptoms of depression and anxiety: A nationally-representative study among U.S. young adults. *Comput. Hum. Behav.* **2017**, *69*, 1–9. [\[CrossRef\]](#)
18. Thompson, R.R.; Garfin, D.R.; Holman, E.A.; Silver, R.C. Distress, Worry, and Functioning Following a Global Health Crisis: A National Study of Americans’ Responses to Ebola. *Clin. Psychol. Sci.* **2017**, *5*, 513–521. [\[CrossRef\]](#)
19. Au, C.H.; Ho, K.K.W.; Chiu, D.K.W. The Role of Online Misinformation and Fake News in Ideological Polarization: Barriers, Catalysts, and Implications. *Inf. Syst. Front.* **2021**. [\[CrossRef\]](#)
20. American Psychological Association. Five Ways to View Coverage of the Coronavirus. 2020. Available online: <https://www.apa.org/helpcenter/pandemics> (accessed on 20 June 2020).
21. Prime, H.; Wade, M.; Browne, D.T. Risk and resilience in family well-being during the COVID-19 pandemic. *Am. Psychol.* **2020**, *75*, 631–643. [\[CrossRef\]](#) [\[PubMed\]](#)
22. Bell, D.J.; Self, M.M.; Davis, C., III; Conway, F.; Washburn, J.J.; Crepeau-Hobson, F. Health service psychology education and training in the time of COVID-19: Challenges and opportunities. *Am. Psychol.* **2020**, *75*, 919–932. [\[CrossRef\]](#) [\[PubMed\]](#)