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The changes in the effects of social media use of Cypriots due to COVID-19 pandemic

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Keywords: Social media COVID-19 Coronavirus Fake news Anxiety Decision making	Social media is the leading medium which is used for communication during the COVID-19 pandemic. The research conducted aims to fill the gap of literature related to social media use during the COVID-19 pandemic. This research aims at uncovering the influences of social media use in several dimensions during lockdown(s). The study aims to answer the research question of: Are the influences of social media use different from normal times? The online questionnaire has been completed by six hundred and sixty-eight users within the period of lockdown. The author prepared the questionnaire, which is composed of 22 positive statements in order to evaluate the effects of social media use during the COVID-19 pandemic. A 5 point Likert scale was used, where reliability and validity were calculated by the Cronbach's alpha value, which was 0.751. Findings highlight that users have more information about COVID-19, and they follow recent information via social media use did not create any panic or anxiety amongst them. This research indicates that respondents' social media use during COVID-19 pandemic, most of social media is as a common purpose triggers this, survival. Before the COVID-19 pandemic, most of social media shares were like a dream or a strong desire that may cause anxiety in others. During the pandemic, people are in lockdown and share similar feelings and follow similar behavioural patterns. As there is a common purpose and struggle via users, psychological well-being is not affected negatively.

1. Introduction

The coronavirus disease (COVID-19) is the recent pandemic which affected every part of the world, which started in Wuhan city of the People's Republic of China [1]. The World Health Organization (WHO) of the United Nations declared COVID-19 as a pandemic on March 11, 2020, where there were 118,000 cases spread to 110 countries [2]. By March 15, 2020, there were 156,400 cases in 142 countries where Europe became the centre of the pandemic. A day after, the number of cases increased to 181,121 in 155 countries. The number of cases jumped to 196,106 on the following day. The total number of confirmed cases jumped to 2,072,113 by 15th April, with 510,122 recoveries and 138,475 fatalities in 185 regions. The number of confirmed cases doubled in a month, where there were 4,621,410 cases with 1,756,657 recoveries and 308,042 fatalities in 188 regions by May 15, 2020. The number of cases reached 8,128,247 with 4,228,194 recoveries and 442, 457 fatalities by 15th June. There were 13,405,694 cases with 7,451, 312 recoveries and 580,552 fatalities by 15th July. These figures show the dramatic increase from 118,000 cases to 13,405,694 cases in four months. Asia was the centre of the epidemic by February, which was followed by Europe in March, where Latin America declared the centre of the epidemic by WHO on 22nd May. These figures show the significant increase and the spread of COVID-19 within 3 months. The United States (3,465,031 cases), Brazil (1,926,824 cases), India (936,181 cases), Russia (745,197 cases) and Peru (333,867 cases) were the countries with the highest number of confirmed cases by mid-July [3–5].

When the recent coronavirus outbreaks were examined, it is observed that SARS had 8098 cases with 774 fatalities. There were 2521 MERS cases with 866 fatalities. On the other hand, COVID-19 reached more than 13 million cases in the fourth month. The rapid expansion is due to several factors such as high infectivity and asymptomatic spread. The media coverage also helped increase awareness related to COVID-19, which benefited people to be aware of the pandemic while also created anxiety for some [6].

This research aims to measure the effect of social media use during the COVID-19 pandemic. As lockdowns will result in more use of social media, it is expected that it will have a significant effect on users. The way people live changed significantly, which is expected to change

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social media use when compared with normal times. People have started to pay more attention to their personal hygiene, well-being and health than normal times. Importance is given to the economic and social status also decreased during the COVID-19 pandemic.

Furthermore, examining the effects of social media use during a pandemic is expected to help crisis management. Countries do not face the pandemic at the same level, so one country's experience can help others. It is expected that new waves of coronavirus will spread in upcoming periods, so examination of the most of the communication medium will help within upcoming months as well [7]. This research aims at uncovering the influences of social media use in several dimensions during lockdowns. The study aims to answer the research question of: 'Are the influences of social media use different from normal times?'. The research continues with the literature review, which examines the impact of social media use in a variety of dimensions such as public awareness, fake news, knowledge sharing and physiological wellbeing and anxiety. The methodology section explains the research procedure, which is followed by findings and results of the study. The conclusion section summarizes research outcomes and answers the question of whether social media use is different than ordinary times and the reasons behind it.

2. Literature review

2.1. Social media use, public awareness and decision-making

Social media is one of the most effective mechanisms of communication in today's world. There were 4.54 billion active internet users and 3.8 billion active social media users by January 2020 [8]. Almost four billion active social media users indicate the penetration of social media. Wu et al. [9] state that social media has the potential to increase the public's awareness of the protection of wildlife [10]. mention that social media could be used to increase public awareness during crises while governments should apply integrated and well-planned communication to increase trust amongst citizens to trigger information sharing and seeking via social networks. Gokalp, Karkın and Calhan [11] inform that social media changed the traditional one-way communication between the citizens and decision-makers, and it enables two-way dialogue between the stakeholders. Authors further state that social media is useful to change decision-makers' behaviours.

Similarly [12], informs that decision-makers' attitudes are affected by social media, and decision-makers have given more importance to social media in recent years. Social media is also used for politics by every political party, and it creates a chance with less budget to circulate their views inexpensively [13]. Social media is also used extensively during the COVID-19 pandemic by the decision-makers. The director of the WHO Dr Tedros Adhanom Ghebreyesus, president of the European Commission Ursula von der Leyen, president of the United States Donald Trump and prime minister of the UK Boris Johnson are just a few examples. Abd-Alrazaq et al. [14] also state that governments should be more active on social media to provide dynamic information regarding urgent issues. Hua and Shaw [15] further state that citizen engagement is vital within the struggle towards pandemic.

Social media is also a useful medium for the firms both to increase communication, customer relationships and sales. Ali et al. [16] further mention that social media use of firms has the potential to increase absorptive capacity and innovation within a firm. Fernandes, Belo and Castela [17] also state that effective social network use could create an advantage for small and medium size firms.

2.2. Social media use and societal movements

In addition to the daily uses for the public and private organizations, social media has also been used for societal movements such as Arab Spring [18], Gezi Park Movement [19], #MeToo Movement (a movement against sexual harassment [20], and the world's most massive

climate protests #FridaysForFuture [21]. These societal movements highlight that social media increased democratic participation, where the people who are censored or have a little appearance on traditional media found a medium to express their views freely.

2.3. Social media use and knowledge sharing

Fung et al. [22] conducted a systematic review on Ebola-related scientific papers and examined the social media used for public health communication. Fung et al. [22] further state that research should be conducted to help health communicators. Furthermore, Avery [23] indicates that public information officers who regularly checked social media felt better prepared for Zika virus. Kaya and Sagsan [24] examine the physicians' use of social media regarding knowledge sharing on social media where the tendency was low due to high occupational stress. Recently [25], inform that there was an extensive circulation of misinformation related to health on social media. As everyone can post anything on social media, trustworthiness is a concern and news validation is required. El-Jardali, Bou-Karroum and Fadlallah [26] emphasize the importance of knowledge translation and argue that investment in these platforms will enable proactive and dynamic response during a crisis, such as pandemics.

2.4. Social media use and fake news

[27] mention that social media users share fake news due to lack of time to authenticate the original resource. Shaw, Kim and Hua [28] research responses of governments for the COVID-19 pandemic in China, Japan and South Korea, the authors inform that fake news spread through social media during the COVID-19 pandemic, which might require legal action to prevent spread. Shimizu [29] state that misinformation and fake news related to COVID-19 also resulted in a rise in racism and xenophobia towards patients and Chinese visitors in Japan, where #ChineseDon't ComeToJapan hashtag has become popular. Huang and Carley [30] state that almost half (45%) of the tweets related to COVID-19 are fake news posted by bots. Authors further state that tweets with fake news links are more likely to be retweeted within the source of the country, which indicates that international spread is minimal. Ahmed et al. [31] analyze COVID-19 and the 5G conspiracy theory on Twitter, and they outline that one fake profile formed the cluster with 408 Twitter users and posted 303 tweets before their closure by Twitter. This ratio highlights the importance of self-awareness of social media users, and they should check the validity of the source before sharing it. Likewise, the importance of sharing scientific data by healthcare professionals on social media is highlighted, which can stop the spread of false information [32,33]. Similarly, Erku et al. [34] emphasize the role of pharmacists in the struggle of misinformation related to the treatments and drugs.

King [35] informed that even the academics could play the part for the circulation of the fake news, by fastly publishing the unfinished or unobserved researches during COVID-19. Researchers can distinguish between the work in progress and published material. At the same time, the media or public might not know the difference and circulate the work via headlines while the presupposition might not be accurate. Furthermore, 'the massive transmission of the fake news over social sites (WhatsApp, Twitter, Facebook) and media has created chaos and a stressful atmosphere for the students' [36], p.1. In order to decrease panic and misinformation, the UK government crackdown fake news [37]. Likewise, the Peru government launched a website to summari ze fake news and later declared that any individual sharing fake news or misinformation will be sentenced to imprisonment [38]. Kadam and Atre [39] mention that official logos of the governmental units are also used within the fake news.

Censorship of fake news is a worldwide debate, and it is not a new topic. The prohibition of fake news will prevent spread of miss information and decrease related panic. On the other hand, it also has

potential risks of banning freedom of speech as the content of fake news will be determined by the governments where autocratic governments might use this even to improve their impact on the media and limit opposite voices [40,41]. Nevertheless, the impact of fake news on society cannot be neglected, whether during pandemics or elections. The 2016 US presidential elections was a recent example. Kaliyar et al. [42] develop a model to increase detection of fake news where they had 98.36% accuracy. Effective use of information technologies might prevent the spread of fake news without government intervention, as Žižek [43] informs that panic related to coronavirus would increase if citizens start to distrust officials relating to manipulation or circulation of information. Naeem and Bhatti [44] indicate that infodemic creates a significant problem for public health during COVID-19 pandemic as citizens find it challenging to distinguish between the fake and the truth which indicates the need of action and awareness to stop the spread of the fake news. Similarly, Ahmad and Murad [45] state that users are unable to distinguish between false and valid information, which increases the panic. The literature above indicates that fake news is one of the main problems of social media. In addition, the literature above also indicates the responsibility of the media to share relevant information, especially during periods of crisis.

2.5. Social media use, psychological well-being, and anxiety

Social media use resulted in psychological problems such as fear of missing out, sensitivity related to the number of likes received, public vulnerability due to expression of mood and anxiety of losing social media accounts [46-48]. Roy et al. [49] further mention that the protection of mental health is vital during the COVID-19 pandemic. In addition to the virus-related anxiety, attention needs to be given to cyberpsychology [36], as people are using their technological devices extensively because of the lockdowns. Coyne, Stockdale & Summers [50] state that problematic cell use might create anxiety [50]. conduct their research before the pandemic, where usage of smartphones is even more widespread nowadays. There are also researchers which indicate that social media use creates anxiety where de Bérail, Guillon & Bungener [51] declare that YouTube usage has a relationship with social anxiety. Ruggieri et al. [52] further mention that negative feedback, comments and sharing might increase the anxiety of users. Authors also mention that social media use results in emotional problems such as anxiety and depression [10,53]. When the recent research related to COVID-19 is examined, Moghanibashi-Mansouriehab [54] mentioned that anxiety levels related to COVID-19 are higher within the people who follow more news. Huang and Zhao [55] also inform that time spent thinking about the COVID-19 damages mental well-being. Hawes et al. [53] indicate that social media use might create anxiety, depending on the time spent [56]. indicates that the time spent on applications increased by 20%. 50% more data traffic is happening in response to COVID-19 [57]. These figures highlight that users will face more problems regarding social media and technology use, as there is a lot of news related to COVID-19.

2.6. Social media use and behavioural effects

Previous researches showed that users reflect their mood on social media, which creates a chance for consultancy [46]. Nisar and Shafiq [58] also state that social media could be used for online healthcare support [59]. further inform that users receive social support from the social network. Rovetta and Bhagavathula [60] advise health agencies to use Google Trends to predict user behaviours and prevent panic-related as what panic users are more likely to search for the keywords related to COVID-19.

The literature review shows the effects of social media. On the one hand, it enables communication via the rest of the world, whereas, on the other hand, it might affect the well-being of users. This research aims to measure the effect of social media use on COVID-19 pandemic, where

there was a lockdown to evaluate whether social media use is the same or different from normal times. Recommendations are made to help pandemic management digitally.

3. Methodology

This research was conducted online in Cyprus, where the government declared lockdown. The respondents were staying at their homes and isolating themselves in order to prevent the spread of COVID-19. The respondents were only allowed to leave their properties for essential consumptions such as urgent market shopping and pharmaceutical needs. As the participants were isolated and stayed at home, responses represent a period where there was extensive social media use. The author did not ask the participants whether they tested positive for SARS-CoV-2 as cases were kept under quarantine, so they did not have access to the internet, which means they were excluded from participating in the research.

Furthermore, the lockdown prevented the collection of data physically. Therefore, users who do not use the internet were excluded. As the research aims to evaluate the impact of COVID-19 and the changes in social media use, the exclusion did not affect the results which are collected. The survey aimed to grasp the changes of social media use within the respondents during COVID-19 pandemic. The quantitative method had been used for this research. A questionnaire is used to collect the primary data. The author prepared the questionnaire based on the systematic literature review. There are not many available questions related to COVID-19; therefore, the questions modified. Question 1, 3, and 20 are modified from Talwar et al. [27]; Q2, 10, 21 and 22 modified from Kaya and Bicen [46]; Q4 and 14 are modified from Moghanibashi-Mansouriehab [54]; Q7, 13 and 19 adapted from Ruggieri et al. [52]; Q8 was adapted from Kaya et al. [12]; Q15, 16 and 17 are adapted from Hsu and Lin [59]. The author prepared the questions Q5, 6, 9, 11, 12 and 18 as they were asking specific questions related to COVID-19 (Please see Appendix B for the whole list).

The online questionnaire circulated at social media platforms (Facebook and Twitter) and respondents were asked to participate voluntarily between 10th March and April 15, 2020. It is composed of 5 demographic questions and 22 positive statements in order to evaluate the effects of social media use during the COVID-19 pandemic. A 5 point Likert scale used, where reliability and validity calculated by the Cronbach's alpha value, which was 0.751. Frequency analysis and standard deviation are provided to show the changes calculated by using IBM SPSS Statistics 20 programme in order to observe the effects of social media use during the COVID-19 pandemic.

68.9% (n = 461) of the respondents were female, whereas 31.1% (n = 208) of them were male. The respondents were from a diverse age group ranging from under 18 to 65 and above. The 25–29 age group was the dominant age group which comprised 19% (n = 127). The most common age group is followed by 30–34 (17.8%, n = 119) and the age group of 18–24 (14.6%, n = 98). Detailed information regarding the demographic breakdown of respondents can be seen in Table 1.

3.1. Findings

Six hundred and sixty-eight users participated in the questionnaire, where Table 1 summarizes the participants' demographic information.

Table 1 indicates that respondents are from diverse age groups and academic backgrounds. Facebook was the most used social media platform (n: 653, 97.6%) which is followed by WhatsApp (n: 590, 88.2%) and Instagram (n:545, 81.5%). 496 (74.1%) of the respondents use YouTube, and only 158 (23.1%) of them use Twitter. The majority of respondents (96.3%) indicated that they use social media for following recent news, which is followed by chat and communication (63.7%) and following friends (54.3%) as can be seen from the table below Tables 2 and 3.

 Table 1

 Demographic information of respondents.

	Frequency/Percentage
Gender	
Female	461 (68.9%)
Male	208 (31.1%)
Age	
Under 18	14 (2.1%)
18-24	98 (14.6%)
25-29	127 (19%)
30-34	119 (17.8%)
35-39	80 (12%)
40-44	61 (9.1%)
45-49	46 (6.9%)
50-54	33 (4.9%)
55-59	63 (9.4%)
60-64	19 (2.8%)
65 and above	9 (1.3%)
Education Level	
Secondary School	38 (5.6%)
High School	175 (26.2%)
Bachelor	291 (43.5%)
Postgraduate	135 (20.2%)
PhD	30 (4.5%)

3.2. Social media use, public awareness and decision making

Statements, 'I have more information related to COVID-19 due to social media' and 'I follow the recent information related to COVID-19 from social media' indicates that social media is used as the primary medium for information retrieval during the pandemic. In addition to the shift towards the digital medium, social media also has to affect the government's decision where the statement, 'Social media is significantly affecting decision-makers decisions' related to COVID-19' is also amongst the top-ranked statements.

3.3. Social media use and fake news

The highest-ranked statements indicated that respondents are aware of fake news and only consider statements from the official organizations as the statement 'I only consider the statements which are declared by WHO, UNICEF, Ministry of Health or Physician's Union' is the highest ranked statement. Moreover, the statement' and 'I check for the original resource for the news that I saw related to COVID-19' is the third-highest ranked statement. In addition, statements 'I share every news related to COVID-19', 'I share COVID-19 related news on social media to get attention' and 'I believe every news I saw on social media related to COVID-19' are amongst the lowest-ranked statements which show that social media usage during COVID-19 does not increase the spread of fake news.

3.4. Social media use, psychological well-being, and anxiety

The statement, 'The shares related to COVID-19 are exaggerated' and 'There is unnecessary panic related to COVID-19 because of social media' indicates that users believe there is exaggeration and panic related to COVID-19. Furthermore, 'My anxiety for COVID-19 started because of social media', 'COVID-19 related news social media makes me panic', and 'I started to have corona phobia due to social media' are amongst the lowest-ranked statements. These statements show that

Table 2

Top reasons for social media use.

Reason	Frequency/Percentage
To follow recent news	605 (96.3%)
Chat and Communicate	397 (63.2%)
To follow friends	340 (54.1%)
To share	303 (48.2%)

Table 3 Stateme

ments.	

Statement	Mean	Std. Deviation
I only consider the statements which are declared by WHO, UNICEF, Ministry of Health or Physician's Union.		.974
I have more information related to COVID-19 due to social media.	4.14	1.122
I check for the original resource for the news that I saw related to COVID-19.		1.121
I follow the recent information related to COVID-19 from social media.	3.86	1.217
The importance I give to environmental hygiene increased due to social media.	3.60	1.411
The importance I give to personal hygiene increased due to social media.	3.54	1.452
The shares related to COVID-19 are exaggerated.	3.47	1.291
Social media is significantly effecting decision-makers decisions' related to COVID-19.	3.44	1.274
There is unnecessary panic related to COVID-19 because of social media.	3.40	1.339
My COVID-19 anxiety increased because of social media.	3.35	1.355
I started to have hygiene obsession due to social media which I had not before.		1.496
I started to have corona phobia due to social media.	2.90	1.453
COVID-19 related news social media makes me panic.	2.89	1.361
My anxiety for COVID-19 started because of social media.	2.86	1.482
Social media enables me to get support related to COVID- 19.	2.84	1.316
Communicating with friends via social media helps me recover from COVID-19 anxiety.	2.51	1.224
I feel stronger related to COVID-19 due to social media.	2.49	1.237
News related to COVID-19 should be censored.	2.11	1.305
I recovered from my COVID-19 anxiety due to social media shares.	2.11	1.148
I believe every news I saw on social media related to COVID-19.	1.91	1.118
I share COVID-19 related news on social media to get attention.	1.69	1.173
I share every news related to COVID-19.	1.60	1.069

users' social media use during COVID-19 does not create panic and does not affect the well-being of users.

3.5. Social media use and behavioural effects

Statements 'I feel stronger related to COVID-19 due to social media', ' Communicating with friends via social media helps me recover from COVID-19 anxiety', and 'Social media enables me to get support related to COVID-19' indicates that social media is not used to get support despite the potential. Furthermore, statements 'The importance I give to environmental hygiene increased due to social media' and 'The importance I give to personal hygiene increased due to social media' indicates that social media use during COVID-19 has a positive impact on hygiene.

Lowest ranked statements indicate that users' social media use during COVID-19 pandemic does not affect users negatively. Highest ranked statements showed that participants use social media as the primary medium for information retrieval, and they have awareness related to fake news. They follow official organizations for the updates, and they check the validity of the news.

4. Results and discussion

Results indicate that social media use during COVID-19 increases public awareness and affects the decision making of officials. This result is also in parallel with the research of Gokalp, Karkın and Calhan [11] and Kaya et al. [12]. The author expects that being able to lead via digital platforms will be one of the critical skills for future leaders.

High awareness related to the spread of fake news ensures that the circulation of fake news will be low as the highest statements also support it. Prevention of fake news is a way to decrease panic as misinformation increases panic even more. It is encouraging that users will not be a victim of fake news. High awareness against fake news is good, and these results contradict with the findings of Gautam and Sharma [36]; Huang and Carley [30] and Ahmed et al. [31]. This difference might be due to regional differences.

The author argues that self-awareness of the users decreases panic as they do not believe fake news even if they are bombarded with it. This is in parallel with the suggestion of Orso et al. [33] while contradicting the findings of Ahmad and Murad [45] and Naeem and Bhatti [44]. It will be interesting to research self-awareness and the panic created by fake news. The author further argues that firms should find ways to demonstrate their hygiene level within their physical and digital presence as hygiene level is expected to affect purchasing behaviours within the post-corona period.

As the majority of the respondents are female, it might be argued that females are more concerned about COVID-19. Respondents' high usage of social media during the pandemic creates a chance of consultancy. The statements show they do not get help from their friends or their social media use does not help them to fight viruses physiologically. Psychologists and Psychiatrist Associations need to create online content to decrease anxiety-related to COVID-19. There are millions of people who isolate themselves at their homes, which may lead to permanent psychological disorders. That period might even also affect relationships, and divorce rates might increase due to lockdowns. It is advised for Health Ministries of Countries to circulate online videos first to increase awareness and decrease potential adverse psychological effects of the pandemic. Despite the fact that there were 795,329 recoveries by the date of April 25, 2020, the information from the recovered cases is not commonly shared. Information from recoveries will help people to lessen the possible panic related to pandemic. Furthermore, online therapies should be provided to lessen the other potential psychological concerns created by COVID-19.

Results indicate that social media use during COVID-19 is different from normal times as almost everyone has the same lifestyle (isolated and fighting the pandemic). Users are not keen with the show-off feature of social media, and social media use is mainly for information retrieval. The author argues that comparison-free social media use results in a decrease in anxiety and protects wellbeing. The users who regularly use social media to publish their daily habits or expensive visits converged their use for a more general-purpose, survival. The use of social media for a common purpose decreased all anxiety which affects social media users during ordinary times.

5. Conclusion

This research had been undertaken online during social isolation, a time in which social media was used extensively. Results show that users' social media use during COVID-19 is different than normal time usage. At regular times before the COVID-19 pandemic, most of the social media shares were like a fantasy or a strong desire that may cause anxiety in others. During the pandemic, people were in lockdown and shared similar feelings and followed similar behavioural patterns.

Users use social media as the primary medium for information retrieval, and they have awareness related to fake news. They follow official organizations for the updates, and they check the validity of the news. The author argues that self-awareness of the users decreases panic as they do not believe fake news even if they are bombarded with it. It will be interesting to research self-awareness and the panic created by fake news in further research to check if the results will be the same. The users also believe that the posts on social media create exaggerated panic related to COVID-19.

The impact of social media on decision-makers is also observed where decision-makers changed the proposed legislation three times in response to society's reaction. Despite the previous literature, findings reveal that social media use does not affect users negatively. Social media did not create any panic or anxiety within the respondents, which is a good indication. Notwithstanding the potential, users do not use social media to get support. Support related to COVID-19 should be circulated to decrease the potential panic and increase the awareness of the users worldwide. Videos, infographics and caps will be useful to get the users attention. Social media use did not create any panic within the respondents during this period and the number of cases also should be considered.

More information regarding the recoveries should be circulated, and online webinars can be organized to decrease the potential concerns and explain the stages which might be faced. COVID-19 had extensive media coverage, and social media is one of the reasons for that. This medium should be used to decrease the potential panic and anxiety, which will help to fight against the pandemic. Support via social media and the spread of original and valid news will help to fight the physiological effects of COVID-19. This research is conducted to evaluate whether social media use during COVID-19 pandemic is different from normal times and contains data of only one country. It will be useful to conduct similar research to check country-specific effects of COVID-19 pandemic.

It is recommended for users to use social media during pandemics while with the awareness of the original source and fake news. During the normal times, social media creates anxiety as it is used to show off. However, during pandemics, concern against fatality is higher than showing off, as there is a purpose and struggle via users, psychological wellbeing is not affected negatively. Users are aware that decisionmakers change their decisions related to the discussions on social media. It is advised for decision-makers to enable two-way dialogue and information exchange with the public, which will ensure that the decisions will not face resistance. Social media content developers can also create engaging content to relax users. Caps, including vital and real data related to COVID-19, can be circulated. To conclude, research findings indicate that users are motivated by the collectivist, not individual interest, survival. Therefore, the users' social media use is different than normal times during COVID-19 pandemic.

This research also has limitations. The survey was conducted only in Cyprus, which limits the generalisation of results. Despite the limitation, this also creates a chance to conduct the same research in other areas to observe the similarities, differences and reasons behind. Furthermore, there is no prior research which examined the tendency and awareness towards fake news. Therefore, changes in recognition of fake news between normal and different times cannot be evaluated. Furthermore, it will be interesting to check the social media use of the recovered cases to see if there are any significant differences. Nevertheless, the research findings indicate that social media use during COVID-19 is different from normal times which includes collectivist and common goals.

Author statement

A single author conducted the research.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.techsoc.2020.101380.

References

- B. Taylor, How the coronavirus pandemic unfolded: a timeline, Retrieved from, https://www.nytimes.com/article/coronavirus-timeline.html, 2020.
- [2] J. Ducharme, World Health Organization Declares COVID-19 a 'Pandemic.' Here's what that Means, Retrieved from, 2020, https://time.com/5791661/who-corona virus-pandemic-declaration/.
- [3] John Hopkins University, Coronavirus COVID-19 global cases by the center for Systems science and engineering (CSSE) at Johns Hopkins University (JHU). Retrieved from, https://www.arcgis.com/apps/opsdashboard/index.html#/bda7 594740fd40299423467b48e9ecf6, 2020.
- [4] BBC, Coronavirus: Europe now epicentre of the pandemic, says WHO, Retrieved from, https://www.bbc.com/news/world-europe-51876784, 2020.

- [5] J. Horton, Coronavirus: what are the numbers out of Latin America?, Retrieved from, https://www.bbc.com/news/world-latin-america-52711458, 2020.
- [6] U. Uras, Coronavirus: comparing COVID-19, SARS and MERS, Retrieved from, https://www.aljazeera.com/news/2020/04/coronavirus-comparing-covid-19-sa rs-mers-200406165555715.html, 2020.
- [7] BBC, Koronavirüs Salgını '18-24 Ay Devam Edebilir, Sonbaharda Daha Büyük Ikinci Bir Dalga Gelebilir, Retrieved from, 2020, https://www.bbc.com/turkce/ha berler-dunya-52499404.
- [8] Statista, Global digital population as of January 2020, Retrieved from, https://www.statista.com/statistics/617136/digital-population-worldwide/, 2020.
- [9] Y. Wu, L. Xie, S. Huang, P. Li, Z. Yuan, W. Liu, Using social media to strengthen public awareness of wildlife conservation, Ocean Coast Manag. 153 (2018) 76–83, https://doi.org/10.1016/j.ocecoaman.2017.12.010.
- [10] Z. Shah, J. Chu, B. Feng, S. Qaisar, U. Ghani, Z. Hassan, If you care, I care: perceived social support and public engagement via SNSs during crises, Technol. Soc. 59 (2019) 101195, https://doi.org/10.1016/j.techsoc.2019.101195.
- [11] B. Gokalp, N. Karkin, H.S. Çalhan, The political use of social networking sites in Turkey: A systematic literature analysis, in: R. Boateng (Ed.), Handbook of Research on Managing Information Systems in Developing Economies, IGI Global, 2020, pp. 503–521, https://doi.org/10.4018/978-1-7998-2610-1.ch025.
- [12] T. Kaya, M. Sagsan, T. Medeni, T. Medeni, M. Yildiz, Qualitative analysis to determine decision-makers' attitudes towards e-government services in a de-facto state, J. Inform. Commun. Ethics Soc. (2020). In press.
- [13] P. Nulty, Y. Theocharis, S. Popa, O. Parnet, K. Benoit, Social media and political communication in the 2014 elections to the European Parliament, Elect. Stud. 44 (2016) 429–444, https://doi.org/10.1016/j.electstud.2016.04.014.
- [14] A. Abd-Alrazaq, D. Alhuwail, M. Househ, M. Hamdi, Z. Shah, Top concerns of tweeters during the COVID-19 pandemic: infoveillance study, J. Med. Internet Res. 22 (4) (2020), e19016, https://doi.org/10.2196/19016.
- [15] J. Hua, R. Shaw, Corona virus (COVID-19) "infodemic" and emerging issues through a data lens: the case of China, Int. J. Environ. Res. Publ. Health 17 (7) (2020) 2309, https://doi.org/10.3390/ijerph17072309.
- [16] A. Ali, W. Bahadur, N. Wang, A. Luqman, A. Khan, Improving team innovation performance: role of social media and team knowledge management capabilities, Technol. Soc. (2020), 101259, https://doi.org/10.1016/j.techsoc.2020.101259.
- [17] S. Fernandes, A. Belo, G. Castela, Social network enterprise behaviors and patterns in SMEs: lessons from a Portuguese local community centered around the tourism industry, Technol. Soc. 44 (2016) 15–22, https://doi.org/10.1016/j. techsoc.2015.11.004.
- [18] E. Blakemore, What was the Arab Spring and how did it spread?, Retrieved from, https://www.nationalgeographic.com/culture/topics/reference/arab-spring-cause /, 2020.
- [19] I.R. Giglou, L. d'Haenens, C. Ogan, Turkish diasporic responses to the Taksim Square protests: legacy media and social media uses in Belgium, The Netherlands and Germany, Telematics Inf. 34 (2) (2017) 548–559, https://doi.org/10.1016/j. tele.2016.09.012.
- [20] C. Maes, L. Schreurs, J. van Oosten, L. Vandenbosch, #(Me)too much? The role of sexualizing online media in adolescents' resistance towards the metoo-movement and acceptance of rape myths, J. Adolesc. 77 (2019) 59–69, https://doi.org/ 10.1016/j.adolescence.2019.10.005.
- [21] S. Varghese, How kids organized one of the world's largest climate protests, Retrieved from, https://www.wired.co.uk/article/climate-change-strike-p rotest-children-social-media, 2019.
- [22] I. Fung, C. Duke, K. Finch, K. Snook, P. Tseng, A. Hernandez, et al., Ebola virus disease and social media: a systematic review, Am. J. Infect. Contr. 44 (12) (2016) 1660–1671, https://doi.org/10.1016/j.ajic.2016.05.011.
- [23] E. Avery, Public information officers' social media monitoring during the Zika virus crisis, a global health threat surrounded by public uncertainty, Publ. Relat. Rev. 43 (3) (2017) 468–476, https://doi.org/10.1016/j.pubrev.2017.02.018.
- [24] T. Kaya, M. Sağsan, The impact of tacit knowledge capacity on social media: an empirical research on physicians in north Cyprus. Proceedings 12th International Conference on Intellectual Capital, Knowledge Management & Organisational Learning (ICICKM 2015), 15-16 November 2015, 2015 (Bangkok, Thailand).
- [25] Y. Wang, M. McKee, A. Torbica, D. Stuckler, Systematic literature review on the spread of health-related misinformation on social media, Soc. Sci. Med. 240 (2019) 112552, https://doi.org/10.1016/j.socscimed.2019.112552.
- [26] F. El-Jardali, L. Bou-Karroum, R. Fadlallah, Amplifying the role of knowledge translation platforms in the COVID-19 pandemic response, Health Res. Pol. Syst. 18 (1) (2020) 58, https://doi.org/10.1186/s12961-020-00576-y.
- [27] S. Talwar, A. Dhir, P. Kaur, N. Zafar, M. Alrasheedy, Why do people share fake news? Associations between the dark side of social media use and fake news sharing behavior, J. Retailing Consum. Serv. 51 (2019) 72–82, https://doi.org/ 10.1016/j.jretconser.2019.05.026.
- [28] R. Shaw, Y. Kim, J. Hua, Governance, technology and citizen behavior in pandemic: lessons from COVID-19 in East Asia, Progress Disaster Sci. 6 (2020) 100090, https://doi.org/10.1016/j.pdisas.2020.100090.
- [29] K. Shimizu, 2019-nCoV, fake news, and racism, Lancet (London, England) 395 (10225) (2020) 685–686, https://doi.org/10.1016/S0140-6736(20)30357-3.
- [30] B. Huang, K.M. Carley, Disinformation and Misinformation on Twitter during the Novel Coronavirus Outbreak, Retrieved from, 2020, https://arxiv.org/abs/2 006.04278.
- [31] W. Ahmed, J. Vidal-Alaball, J. Downing, F. López Seguí, COVID-19 and the 5G conspiracy theory: social network analysis of twitter data, J. Med. Internet Res. 22 (5) (2020), e19458, https://doi.org/10.2196/19458.

- [32] C. O'Connor, M. Murphy, Going viral: doctors must tackle fake news in the covid-19 pandemic, BMJ (Clin Res. Ed.) 369 (2020), https://doi.org/10.1136/bmj. m1587 m1587.
- [33] D. Orso, N. Federici, R. Copetti, L. Vetrugno, T. Bove, Infodemic and the spread of fake news in the COVID-19-era [published online ahead of print, 2020 23rd April], 10.1097/MEJ.00000000000713, Eur. J. Emerg. Med. (2020), https://doi.org/ 10.1097/MEJ.00000000000713.
- [34] D.A. Erku, S.A. Belachew, S. Abrha, M. Sinnollareddy, J. Thomas, K.J. Steadman, W.H. Tesfaye, When fear and misinformation go viral: pharmacists' role in deterring medication misinformation during the 'infodemic' surrounding COVID-19. Research in Social & Administrative Pharmacy : RSAP, S1551-7411(20)30455-1, Advance online publication, 2020, https://doi.org/10.1016/j. sapharm.2020.04.032.
- [35] A. King, Fast news or fake news?: the advantages and the pitfalls of rapid publication through pre-print servers during a pandemic, EMBO Rep. 21 (6) (2020 4th June), e50817, https://doi.org/10.15252/embr.202050817. PMID: 32496027; PMCID: PMC7271647.
- [36] R. Gautam, M. Sharma, 2019-nCoV pandemic: a disruptive and stressful atmosphere for Indian academic fraternity, Brain Behav. Immun. (2020), https:// doi.org/10.1016/j.bbi.2020.04.025.
- [37] BBC, Coronavirus: Fake News Crackdown by UK Government, Retrieved from, 2020, https://www.bbc.com/news/technology-52086284.
- [38] A. Alvarez-Risco, C.R. Mejia, J. Delgado-Zegarra, S. Del-Aguila-Arcentales, A. A. Arce-Esquivel, M.J. Valladares-Garrido, M. Rosas Del Portal, L.F. Villegas, W. H. Curioso, M.C. Sekar, J.A. Yáñez, The Peru approach against the COVID-19 infodemic: insights and strategies, Advance online publication, Am. J. Trop. Med. Hyg. (2020), https://doi.org/10.4269/ajtmh.20-0536.
- [39] A.B. Kadam, S.R. Atre, Negative impact of social media panic during the COVID-19 outbreak in India, J. Trav. Med. 27 (3) (2020), https://doi.org/10.1093/jtm/ taaa057 taaa057.
- [40] J. Henley, Global crackdown on fake news raises censorship concerns, Retrieved from, https://www.theguardian.com/media/2018/apr/24/global-crackdown-onfake-news-raises-censorship-concerns, 2018.
- [41] E. Bothwell, Fake news laws may 'catch on' during coronavirus, Retrieved from, https://www.timeshighereducation.com/news/fake-news-laws-may-catch-du ring-coronavirus, 2020.
- [42] R. Kaliyar, A. Goswami, P. Narang, S. Sinha, FNDNet a deep convolutional neural network for fake news detection, Cognit. Syst. Res. 61 (2020) 32–44, https://doi. org/10.1016/j.cogsys.2019.12.005.
- [43] S. Žižek, Pandemic!: Covid-19 Shakes the World, , OR Books, 2020.
- [44] S.B. Naeem, R. Bhatti, The Covid-19 'infodemic': a new front for information professionals, Health Inf. Libr. J. (2020), https://doi.org/10.1111/hir.12311, 10.1111/hir.12311. Advance online publication.
- [45] A.R. Ahmad, H.R. Murad, The impact of social media on panic during the COVID-19 pandemic in Iraqi kurdistan: online questionnaire study, J. Med. Internet Res. 22 (5) (2020), e19556, https://doi.org/10.2196/19556.
- [46] T. Kaya, H. Bicen, The effects of social media on students' behaviors; Facebook as a case study, Comput. Hum. Behav. 59 (2016) 374–379.
- [47] A. Blachnio, A. Przepiórka, Facebook intrusion, fear of missing out, narcissism, and life satisfaction: a cross-sectional study, Psychiatr. Res. 259 (2018) 514–519. http s://.org/10.1016/j.psychres.2017.11.012. June 2017.
- [48] A.M. Rosenthal-von der Pütten, M.R. Hastall, S. Köcher, C. Meske, T. Heinrich, F. Labrenz, S. Ocklenburg, Likes" as social rewards: their role in online social comparison and decisions to like other People's selfies, Comput. Hum. Behav. 92 (August 2018) (2019) 76–86, https://doi.org/10.1016/j.chb.2018.10.017.
- [49] D. Roy, S. Tripathy, S. Kar, N. Sharma, S. Verma, V. Kaushal, Study of knowledge, attitude, anxiety & perceived mental healthcare need in Indian population during COVID-19 pandemic, Asian J. Psych. 51 (2020) 102083, https://doi.org/10.1016/ j.ajp.2020.102083.
- [50] S. Coyne, L. Stockdale, K. Summers, Problematic cell phone use, depression, anxiety, and self-regulation: evidence from a three year longitudinal study from adolescence to emerging adulthood, Comput. Hum. Behav. 96 (2019) 78–84, https://doi.org/10.1016/j.chb.2019.02.014.
- [51] P. de Bérail, M. Guillon, C. Bungener, The relations between YouTube addiction, social anxiety and parasocial relationships with YouTubers: a moderatedmediation model based on a cognitive-behavioral framework, Comput. Hum. Behav. 99 (2019) 190–204, https://doi.org/10.1016/j.chb.2019.05.007.
- [52] S. Ruggieri, G. Santoro, U. Pace, A. Passanisi, A. Schimmenti, Problematic Facebook use and anxiety concerning use of social media in mothers and their offspring: an actor-partner interdependence model, Add. Behav. Rep. (2020) 100256, https://doi.org/10.1016/j.abrep.2020.100256.
- [53] T. Hawes, M. Zimmer-Gembeck, S. Campbell, Unique associations of social media use and online appearance preoccupation with depression, anxiety, and appearance rejection sensitivity, Body Image 33 (2020) 66–76, https://doi.org/ 10.1016/j.bodyim.2020.02.010.
- [54] A. Moghanibashi-Mansourieh, Assessing the anxiety level of Iranian general population during COVID-19 outbreak, Asian J. Psych. 51 (2020) 102076, https:// doi.org/10.1016/j.ajp.2020.102076.
- [55] Y. Huang, N. Zhao, Generalized anxiety disorder, depressive symptoms and sleep quality during COVID-19 outbreak in China: a web-based cross-sectional survey, Psychiatr. Res. 288 (2020) 112954, https://doi.org/10.1016/j. psychres.2020.112954.
- [56] A. Hutchinson, People are spending 20% more time in apps during the COVID-19 lockdowns [Report] Retrieved from, https://www.socialmediatoday.com/news/pe ople-are-spending-20-more-time-in-apps-during-the-covid-19-lockdowns-re/57540 3/, 2020.

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- [57] M. Sweney, Vodafone reports 50% rise in internet use as more people work from home, Retrieved from, https://www.theguardian.com/business/2020/mar/18/vo dafone-rise-data-usage-more-people-work-from-home-coronavirus, 2020.
- [58] S. Nisar, M. Shafiq, Framework for efficient utilization of social media in Pakistan's healthcare sector, Technol. Soc. 56 (2019) 31–43, https://doi.org/10.1016/j. techsoc.2018.09.003.
- [59] C. Hsu, J. Lin, Antecedents and gains of user participation in social media in Taiwan, Technol. Soc. 61 (2020) 101243, https://doi.org/10.1016/j. techsoc.2020.101243.
- [60] A. Rovetta, A.S. Bhagavathula, COVID-19-Related web search behaviors and infodemic attitudes in Italy: infodemiological study, JMIR Publ. Health Surv. 6 (2) (2020), e19374, https://doi.org/10.2196/19374.

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