



Effect of COVID-19 Misinformation Among Adults of the Southern U.S.

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Abstract

The COVID-19 pandemic is the worst health crisis in the world in the last 100 years with devastating effects on human lives and with severe economic and social disruption. Unfortunately there is a lot of misinformation about COVID-19, which is disseminated widely in social media. Misinformation is highly prevalent globally. It may lead to false assumption and incorrect information about the disease, its spread, treatment and effects. People with misinformation can have unfounded fear, mental health issues, serious illness or death. This study will analyze Southern adult's knowledge of COVID-19 before and after interacting with a media source that may contain real information or misinformation to determine differences between rural and urban Southerners and how this affects the high positivity rates of COVID-19 among Southerners.

Introduction

The COVID-19 pandemic is the worst health crisis in the world in the last 100 years with devastating effects on human lives and with severe economic and social disruption. Since this has been an unprecedented catastrophe, it has been accompanied by "infodemic", which is a rapid, global spread of both accurate information and misinformation about COVID-19. Tedros Adhanom Ghebreyesus, Director-General of the World Health Organization (WHO) said in addition to a pandemic, "we are fighting an infodemic," referring to fake news that "spreads faster and more easily than this virus", (WHO, 2020). Social media platforms are very effective tools with unlimited potential to disseminate correct and factual health information.

Unfortunately there is a lot of misinformation about COVID-19, which is disseminated widely in social media. Misinformation is highly prevalent globally. It may lead to false assumption and incorrect information about the disease, its spread, treatment and effects. People with misinformation can have unfounded fear, mental health issues, serious illness or death.

They can put themselves in dangerous situations,

causing them to risk losing their lives to COVID-19. If people believe in misinformation that is presented to them it can be a matter of life or death for them and others. (Krause, Freiling, Beets, et al 2020). This is particularly true in the Southern United States where incidence of COVID-19 is high, and it seems part of the issue that perpetuates the severity is misinformation. COVID-19 has had a significant impact on the South, with more cases of COVID-19 there than any other region in the US. Texas and Florida alone have had over four million cases total, making up over eight percent of the population in both states (Obiala et al, 2020). Misinformation has been rampant in the South, especially Trump supporters, who referred to the virus as a "hoax" (Kouzy et al, 2020). With the lack of awareness, knowledge, and preparedness among the general public, extremist groups have begun to promote racial hatred, apocalyptic conspiracy theories, and end of the world narratives as an explanation for the state of society currently. For example, ISIS is promoting the idea that the pandemic is "God's Wrath" against those who do not believe in the same ideals as them (Basit, 2020).

Southerners who rely on social media to obtain information about the COVID-19 pandemic are significantly affected, especially those at risk from COVID due to preexisting conditions because it creates a fear-mongering environment. One study found that the dissemination of misinformation about health can lead to undesirable outcomes such as fear, anxiety, misunderstanding of the disease, and problems in the patient-doctor relationship (Li et al., 2020).

This study will analyze Southern adults' knowledge of COVID-19 before and after interacting with a media source that may contain real information or misinformation to determine differences between rural and urban Southerners and how this affects the high positivity rates of COVID-19 among Southerners. In order to get a broader understanding of how COVID-19 misinformation affects adults in the U.S., existing research and studies should be analyzed and compared to the results of this study. This study will also see the effect of misinformation of the COVID-19 among adults from areas with different levels of urbanization and social media activity of the Southern United States. All misinformation about COVID-19

pandemic creates mistrust among the public, leads to unsafe health practices and public behavior leading to increase in disease transmission, morbidity and mortality (Bridgeman et al 2020).

Constant exposure to misinformation increases reinforcement of wrong beliefs and unsafe health practices. Misinformation and misperceptions are associated with higher risk behavior and lower compliance of health guidelines.

Literature Review

The main platforms for social media include Twitter, WhatsApp, Snapchat, YouTube, Instagram, Facebook, Messenger, and Reddit. Different studies analyze different social media platforms to see prevalence of misinformation and comparison with other news media. In a study published in The Harvard Kennedy School Misinformation Review, the authors investigated the relationship between media misinformation of COVID-19 and public attitude and behavior (Bridgman et al., 2020). They found more misinformation was circulating on social media platforms than the mainstream news media (Bridgman et al. 2020). The results of their study showed more misinformation on Twitter than the mainstream media (Bridgman et al., 2020). The authors collected 2.5 million tweets referring to COVID-19, collected 9000 articles from news sites, and conducted a nationally representative survey about media and COVID-19 perception (Bridgman et al., 2020). They concluded use of social media broadly contributes to misperceptions, with more misinformation on platforms such as Twitter (Bridgman et al. 2020). This misinformation is conveyed in the form of non-factual videos, statements, inappropriate or wrong recommendations and discriminating statements (Bridgman et al. 2020). There is comparatively more misinformation on social media than on the mainstream media. Also, mainstream media gives more coverage to public health recommendations.

The role of social media misinformation is spread in all social media and mainstream media too. There have been multiple pseudoscientific theories, conspiracy theories, misinformation, and false claims about the origin, spread, treatment and impact of COVID-19 pandemic. Other misinformation and conspiracy theories related to COVID-19 include the origin of COVID-19 as a Chinese biological weapon, the role of Russia in creating the virus, and the health and pharmaceutical industries causing the COVID-19 pandemic spread. Other false claims that gained traction include the role of some disinfectants,

hydroxychloroquine, and ultraviolet light in killing disease.

There have been reports of use of medicine for COVID-19 treatment with no scientific rationale. In a joint project done by Northeastern University, Harvard University, Rutgers University, and Northwestern University, the authors did a national survey to explore the misinformation about COVID-19 and vaccine acceptance (Baum et al., 2020). The study confirmed the role of social media to misinformation about COVID-19 (Baum et al., 2020). In the survey of 21,000 people across the nation, researchers found misinformation in all types of media (Baum et al., 2020). The study showed that there was clustering of relatively higher levels of misperceptions in the southern and southeastern portions of the USA about 12-16% compared, other clusters of relatively low levels of beliefs in misperceptions in the northwestern, north central, and northeastern regions (Baum et al., 2020). The use of mobile instant messaging (MIM) like WhatsApp, Snapchat and Facebook Messenger are strongly correlated with believing misinformation (Baum et al., 2020). Around 31% of WhatsApp, 28% of Snapchat, 26% of Messenger, 25% of Wikipedia, and 23% of Instagram users believed in inaccurate or false claims (Baum et al., 2020). Television news, newspapers, and online news sites had lower levels of misinformation, about 11% (Baum et al., 2020).

Among mainstream television networks, Fox News had 18% of false claims believed among viewers, compared to CNN having 16% of false claims or MSNBC with 15% of false claims believed (Baum et al., 2020). Also, studies found younger people are more likely to believe in false claims than older people: 17% in 25-44 years, 12% in 45-64 years age and 8% above 65 years (Baum et al., 2020). The study also revealed the role of race in COVID misinformation. More African American believed in false claims (17%) than Hispanic (16%), White, and Asian Americans (13% each) (Baum et al., 2020). As for gender, men have a 15% chance of believing a given false claim compared to 12% in women (Baum et al., 2020). The study finds men are more likely than women to believe 10 of the 11 given false claims (Baum et al., 2020). Among political parties, across the 11 false claims, 16% of Republicans believe a given false claim, compared to 13% each for Democrats and independents on average (Baum et al., 2020). The study also found that misinformation was more prevalent in rural areas compared to more urbanized areas (Baum et al., 2020).

Presentation of misinformation in social media with its rapid dissemination to the general public leads to

misperception and public health risks. Social media platforms should be monitored for COVID-19 and other health disinformation since it proliferates rapidly.

The social media platforms should try to remove potentially harmful misinformation themselves while the Center for Disease Control (CDC) and other health agencies should try to present factual information to the public. As the pandemic grows deadly, it is critical to understand different forms of COVID misinformation and consequences. Various forms of COVID-19 misinformation and conspiracy theories can differ in their impact. We need to understand what makes people susceptible to misinformation, conspiracy theories and wrong beliefs about COVID-19. There are people who propagate misinformation or conspiracy theories for political or economic interest. Implications of this can potentially be dangerous in causing an increase in disease spread by unsafe public behavior. In a research article published in Harvard Kennedy School Misinformation Review, the authors found that more people believed in conspiracy theories than about misinformation about safe health practice during COVID-19 pandemic. The authors found that conspiracy theories promoted by celebrities or partisan figures exhibited more support. It is individual predisposition and their ideology and distrust in physicians or scientists that may make people susceptible to conspiracy theories or misinformation. It is important for public health authorities to effectively communicate with the public to counter and present correct information.

Reviewing the literature about misinformation about the COVID-19 pandemic comparatively, more misinformation is prevalent on social media platforms than in news media. Presentation of misinformation in social media with its rapid dissemination to the general public leads to misperception and public health risks. Social media platforms should be monitored for COVID-19 and other health disinformation since it proliferates rapidly. The social media platforms should try to remove potentially harmful misinformation themselves while the Center for Disease Control (CDC) and other health agencies should try to present factual information to the public. The research presented has analyzed different aspects of knowledge of COVID-19 information, but there is little to no information on how levels of urbanization can affect this knowledge. In addition, studies pertaining to the South do not take into account levels of urbanization primarily because the South is still one of the more rural regions of the United States. As a result, this research aims to address this gap through focusing on urban areas by assessing knowledge of COVID-19 and awareness of

misinformation. Future research in this area may take into account urban studies and focus on urbanization in relation to other significant events like the COVID-19 pandemic.

Methods

To evaluate the effect of misinformation, a regional representative survey containing questions about common misinformation or misperceptions about COVID-19 pandemic, COVID-19 vaccine, and exposure to social media will be conducted, just as other studies regarding COVID-19 misinformation had been conducted. This will be an online survey administered to adults of either sex living in Southern United States. The survey will likely be distributed via personal contacts to reach people in many places in the South, and contacts will be utilizing the snowball method of distribution as well who are living in the South. No personal information will be collected to protect the research subject's privacy. The survey will have informed consent at the beginning to inform participants about the research project. Data will be collected and analyzed for only those responding to all the questions in the survey. Google Forms will be utilized for its user-friendly interface and the ability to easily create surveys with it.

The survey will have a pre-test consisting of the below questions, and a post test with the same questions to see if the videos changed the minds of the respondents. Participants will be asked about their social media usage as well. Following questions utilize a Likert Scale, ranging from Strongly Agree to Strongly Disagree with a series of claims regarding COVID-19. Strongly Agree means that you believe the statement is one of definite fact, Agree means you believe the statement is true but there is possibility that it is wrong, not sure means you don't know if the statement is correct or not, disagree means you think the statement is false but there is some possibility that it is true, and strongly disagree means you think the statement is an impossible myth. The participants will then be asked if their birthday falls within the first six or the last six months of the year to split them off into two groups: one which will watch the video with misinformation, and one which will watch the video with real information. The people whose birthdays are in the first six months of the year will watch the video with real information, and the people whose birthdays are in the last six months of the year will watch the video with misinformation. The link to the video with real information is <https://www.youtube.com/watch?v=i0ZabxM4Y>

and the link to the video with misinformation is <https://vimeo.com/481390190>. The reason for choosing the informational video is because it has a short length of five minutes, and it was created by the WHO (World Health Organization), a leading global organization on health and safety. The reason for choosing the misinformation video was because it was also short at 3 minutes, and it contains misinformation that makes the people in the video appear to be qualified experts in their fields while presenting inaccurate information. Misinformation in the form of a video is also one of the most common forms of media through which COVID-19 misinformation is spread (Bridgman et al., 2020). Additionally, the people in the misinformation video cover many of the questions that are in the survey.

Questionnaire for the survey:

The survey will begin with informed consent that states the following:

- Requirements: You **MUST** be at least 18 years of age to participate.
- I am asking for your voluntary participation in my research project. Please read the following information about the project. If you would like to participate, please select the box below.
 - The purpose of the project is to see the prevalence of misinformation among adults of the Southern US.
 - If you participate, you will be asked to fill out some questions regarding COVID-19, social media, and watching a video about COVID-19.
 - The survey should take between 10-15 minutes. Please be aware that you might be exposed to misinformation. You will know at the end of the survey.
 - The benefits of the survey are that you will get a chance to receive useful information related to COVID-19, and the results of the study will help determine areas where increased education related to COVID-19 can help prevent further cases.
 - Anonymity of participants will be maintained. Participants will not have any confidential information obtained, but they will be asked their ZIP code and any social media platforms used. Personal information will not be shared with anyone, as data will be presented as part of a large group study. Participation in this study is completely voluntary. If you decide not to participate there will not be any negative consequences. Please be aware that if you decide to participate, you may stop participating at any time.
 - If you have any questions about this study, feel free to contact: 144electron@gmail.com

1. What kind of area do you live in?

- A. Urban
- B. Suburban
- C. Rural

2. Which social media platforms do you get most of your news about COVID-19 pandemic from, if any? (select all that apply) Options are: Facebook, Twitter, Instagram, Youtube, Whatsapp, Messenger, TikTok, Discord, Tumblr, Wechat, Reddit, Snapchat, Other: (participants give their own answers)

3. Which social media platforms are you most ACTIVE on? (select all that apply) Options are: Facebook, Twitter, Instagram, Youtube, Whatsapp, Messenger, Discord, TikTok, Tumblr, Wechat, Reddit, Snapchat, Other: participants give their own answers).

4. How often do you use social media daily?

- A. Not at all
- B. 0-2 Hours
- C. 2-5 Hours
- D. 5-8 Hours
- E. 8+ Hours

Pre- and Post-Test Questions:

Options for all twelve questions are as follows: Strongly Agree, Agree, Don't Know, Disagree, and Strongly Disagree.

1. Coronavirus was created as a biological weapon to be used against the United States.
2. Hospitals are inflating the number of COVID-19 cases and deaths so they can be paid more.
3. COVID-19 can be spread through 5G cell phone coverage.
4. COVID-19 pandemic is a deliberate scheme for population control created by some powerful groups.
5. COVID-19 vaccines cannot change a person's DNA.
6. COVID-19 vaccine causes infertility in women.
7. Chloroquine is NOT an effective treatment for COVID 19.
8. People who have or have gotten COVID-19 can be tracked because of it.
9. COVID-19 vaccine is safe and should be administered to people who want it.
10. Antibiotics can prevent COVID-19.
11. Flu vaccines increase the chances of getting COVID-19. Strongly Agree, Agree, Not
12. Everyone should wear masks because it is helpful in stopping COVID-19 from spreading.

Risk and Safety

The people taking this survey might be exposed to misinformation, therefore putting them at risk if they

believe the misinformation. A disclaimer will be put at the beginning of the survey warning of potential misinformation, and at the end of the survey, the respondent will be informed whether or not they were misinformed. Additionally, respondents who received the misinformation video will be given the link to the video with real information at the end.

Data Analysis

For the questions, they will be evaluated on a scale from 0 to 4 depending on the participant's answers for each question. A 0 will be given if they choose to strongly agree for incorrect statements and strongly disagree for correct statements. A 1 will be given if they choose agree for incorrect statements and disagree for correct statements. A 2 will be given they choose not sure. A 3 will be given if they choose disagree for incorrect statements and agree for correct statements. A 4 will be given if they strongly disagree for incorrect statements and strongly agree for correct statements. Questions 1, 2, 3, 4, 6, 8, 10, and 11 are all incorrect statements, while questions 5, 7, 9, and 12 are correct statements.

For data analysis, a paired T-test will be run to see if the results of the survey were statistically significant in the number of people who believed the misinformation. Social media activity and urbanization level will also be compared in relation to the results to see if there is any trend with increased or decreased social media use in relation to misinformation. Additionally, the correlation between birthday and scores will be compared to confirm that there is no correlation between birthday and COVID-19 knowledge, and it is a fair and random way to test participants.

Results

There were 52 participants across three states, which were Arkansas, Florida, and Texas. Out of the 52 participants, 18 of them watched the video with the real information (34.6%), and 34 participants watched the video with misinformation (65.4%). The data was divided into two categories, one for misinformation and one for real information, and the average scores for the pre-test and post-test for each category are shown below in Table 5. The average pre-test score for the real information category was 38.944, and the average pre-test score for the misinformation category was 38.353. The average post-test score for the real information category was 39.389, and the average post-test score for the misinformation category was

35.029.

A paired t-test was run to compare the scores for the pre-test and post-test in both categories. The paired t-tests were run with a 95% confidence interval, and results would be considered significant if the p-value was less than 0.05. Table 1 depicts the results of the paired t-test for the pre- and post- tests and whether they were significant or not. In Table 1, the p-value for the paired t-test comparing the pre-test scores for the real information (control group) and misinformation (experimental group) categories was 0.4549, which is considered to be not statistically significant. The p-value for the paired t-test comparing the post-test scores for the two categories was 0.0419, which is less than 0.05 and means that the results of the post-test are statistically significant.

To see the effect of different urbanization levels and social media activity, four ANOVA tests were conducted, two for the pre-test and two more for the post-test. The ANOVA tests for the different urbanization levels were conducted with three variables: urban, suburban, and rural.

The ANOVA tests for different levels of social media activity were conducted with four variables: 0-2 hours, 2-5 hours, 5-8 hours, and 8+ hours. All four ANOVA tests were conducted with a 95% confidence interval, and results were statistically significant if the p-value was less than 0.05. The f-ratio indicates if variation among the groups is random or nonrandom. Table 2 depicts the results of the ANOVA tests for different levels of urbanization and social media activity for both the pre- and post-tests. For different urbanization levels in the pre-test, the f-ratio was 3.87412, meaning that the variation in the scores is likely not due to chance, and the p-value is 0.03081, meaning that the differences in the scores are statistically significant. For different levels of social media in the pre-test, the f-ratio was 0.61108 and the p-value was 0.612759, meaning that there was no statistical significance. For different urbanization levels in the post-test, the f-ratio was 0.62462 and the p-value was 0.541674, which is not statistically significant. For different levels of social media in the post-test, the f-ratio was 0.62115 and the p-value was 0.60648, which is not statistically significant.

Tables 3 and 4 depict the average pre-test, post-test, and change in scores for different levels of urbanization and social media activity, respectively. The trends in the data show that people from urban and suburban areas had higher scores on the pre-test, but the greatest change in their scores as well. For different levels of social media activity, the lower levels of social media activity had the lowest pre-test scores

and the greatest change in score, while the higher levels of social media activity had higher pre-test scores and a smaller change in score.

Table 1: Paired T-test Results Comparing Experimental and Control Groups

Pre- or Post-Test	P-value	Result
Pre-Test	0.4549	Not Significant
Post-Test	0.0419	Significant

Table 2: ANOVA Test Results for Different Urbanization Levels and Social Media Activity

Pre- or Post-Test	Å	f-ratio	p-value	Result
Pre-Test	Urbanization Level	3.87412	0.03081	Significant
	Social Media Activity	0.61108	0.612759	Not Significant
Post-Test	Urbanization Level	0.62462	0.541674	Not Significant
	Social Media Activity	0.62115	0.60648	Not Significant

Table 3: Average Pre-Test, Post-Test, and Change in Scores for Urbanization Level

Urbanization Level	Average Pre-Test Score	Average Post-Test Score	Average Change/Percent Decrease
Urban	35.5714	33	-2.5714 (-7.23%)
Suburban	39.6667	36	-3.6667 (-9.24%)
Rural	34.332	32	-2.332 (-6.79%)

Table 4: Average Pre-Test, Post-Test, and Change in Scores for Social Media Activity

Social Media Activity	Average Pre-Test Score	Average Post-Test Score	Average Change/Percent Decrease
0-2 Hours	35.8571	33	-2.8571 (-7.97%)
2-5 Hours	38.6478	33.7222	-4.9256 (-12.74%)
5-8 Hours	39.3333	38.6667	-0.6666 (-1.69%)
8+ Hours	38	36.2	-1.8 (-4.74%)

Table 5: Average Scores for Pre- and Post-Tests

Video Type	Pre-Test Score	Post-Test Score
Real Information	38.944	39.389
Misinformation	38.353	35.029

Discussion

Since the results from the paired t-test for the pre-test came back as not significant, this indicates that splitting the participants into two groups by whether their birthday was in the first six or last six months was a fair and random way to separate them. There was no significant difference in the scores of the two groups for the pre-test, although there were twice as many participants in the misinformation group as there were in the real information group. For the post-test, the difference between the two groups was significant, indicating that the misinformation video did cause a significant difference in the scores compared to the real information video. Additionally, since the misinformation video produced a significant difference in the scores, this justifies using the ANOVA tests to find any significant differences between the different levels of urbanization and social media activity

because now it can be seen how misinformation affects people from areas with different levels of urbanization and social media activity.

There were no significant differences in the level of social media activity observed in the study overall, although the trends did indicate better performances from people with a higher level of social media activity. The scores of the participants did not diverge much from the

pre-test to the post-test, but there was a greater decrease in the score for people with lower levels of social media activity. However, the ANOVA test for both the pre- and post-test still indicated that this result was not statistically significant; therefore, it cannot be concluded that there is any significant difference among different levels of social media activity and prevalence of COVID-19 misinformation.

In the pre-test, there was a significant difference between the scores for people from areas with different levels of urbanization; however, after watching the misinformation video, there was not a significant difference between the scores, meaning that the scores got closer together. The trends support this finding, as the suburban and urban areas had a higher score in the pre-test while the rural areas had a lower score, and after watching the misinformation video, the suburban and urban areas experienced the greatest decrease in their score in terms of points and percentage. As a result, the misinformation video did have a significant difference on different levels of urbanization due to causing scores from areas with different levels of urbanization to come closer together.

Conclusion

There were several limitations within the study that were observed during the data collection process. One major limitation was the sample size and reach of the study. The study had only 52 participants, which was a lot smaller in comparison to other studies related to COVID-19 misinformation that had thousands of participants. Additionally, the snowball method of distribution definitely led to having more bias in the participants that were more closely related to the researcher. The reach of the study only went out to three southern states, which were Arkansas, Florida, and Texas, despite there being several more southern states from which participants could have been included. As a result, the study cannot be fully representative of the South as a whole due to these limitations. Another major limitation was the COVID-19 pandemic, which meant that the research had to be

conducted remotely from where the researcher lived, which proved to be challenging as it meant that it limited the distribution of the survey to contacts that the researcher knew prior to distribution of the survey. Another major limitation was the availability of COVID-19 misinformation to be used in the survey. Most major social media platforms had already been addressing the issue of COVID-19 misinformation and had been taking strict action against it, especially video-sharing sites such as YouTube, which meant it was more difficult to find misinformation in the form of video as a result. The researcher was able to find a video with all the necessary criteria for a persuasive misinformation video, but it was one of the most difficult parts of the research process. Another limitation of the study was the size of the experimental and control groups. The experimental group that watched the misinformation video had 34 participants, while the control group that watched the real information video had only 18 participants, despite the fact that each group was split between whether their birthday was in the first six or last six months of the year. The researcher hoped that there would be around an equal number of participants in each group due to the fact that the first six and last six months almost have the same number of days, but the experimental group was almost double the size of the control group. This could mean that the results of the control group were not as accurate as the experimental group, leading the results of the paired t-test to be somewhat skewed as a result.

Despite these limitations, the study was able to show that COVID-19 misinformation does have a significant effect on participants, all of whom are adults from the southern U.S., and this effect is especially apparent on those groups of participants with higher scores in the pre-test. The most notable result is that COVID-19 misinformation had a more significant effect on participants from urban and suburban areas, suggesting that there is a greater need to prevent misinformation in suburban and urban areas as adults from these areas were more susceptible.

This could be attributed to the fact that more COVID-19 misinformation is already present in rural areas, and this explains why they initially have a lower score on the pre-test and have the smallest change after watching the misinformation video compared to people from urban and suburban areas.

Future studies could be conducted to look at other factors related to COVID-19 misinformation in cities or rural areas specifically to see what needs to be targeted the most to prevent COVID-19 misinformation. These factors could include race, age, gender, etc.

Works Cited

- Ahmed, Wasim et al. "COVID-19 and the 5G Conspiracy Theory: Social Network Analysis of Twitter Data." *Journal of Medical Internet Research* vol. 22,5 e19458. 6 May. 2020, doi:10.2196/19458
- Badell-Grau, Rafael A et al. "Investigating the Prevalence of Reactive Online Searching in the COVID-19 Pandemic: Infoveillance Study." *Journal of Medical Internet Research* vol.22,10 e19791. 27 Oct. 2020, doi:10.2196/19791
- Basit, Abdul. "The COVID-19 Pandemic: An Opportunity for Terrorist Groups?" *Counter Terrorist Trends and Analyses*, vol. 12, no. 3, 2020, pp.7-12. JSTOR, www.jstor.org/stable/26915444. Accessed 30 Oct. 2020.
- Bastani, Peivand, and Mohammad Amin Bahrami. "COVID-19 Related Misinformation on Social Media: A Qualitative Study from Iran." *Journal of Medical Internet Research*, 10.2196/18932. 5 Apr. 2020, doi:10.2196/18932
- Baum, M., Ognyanova, K., Quintana, A., Perlis, R.H., & Chwe, H. "Report #14: Misinformation and Vaccine Acceptance." *State of the Nation: A 50-State COVID-19 Survey*, 2020.
- Bridgman, A., Merkley, E., Loewen, P. J., Owen, T., Ruths, D., Teichmann, L., & Zhilin, O. (2020). The causes and consequences of COVID-19 misperceptions: Understanding the role of news and social media. *Harvard Kennedy School (HKS) Information Review*. <https://doi.org/10.37016/mr-2020-028>
- Cuan-Baltazar, Jose Yunam et al. "Misinformation of COVID-19 on the Internet: Infodemiology Study." *JMIR Public Health and Surveillance*. vol. 6,2 e18444. 9 Apr. 2020, doi:10.2196/18444
- Hauer, Michael K, and Suruchi Sood. "Using Social Media to Communicate Sustainable Preventive Measures and Curtail Misinformation." *Frontiers in Psychology* vol. 11 568324. 16 Oct. 2020, doi:10.3389/fpsyg.2020.568324.
- Hernandez-Garcia, Ignacio, and Teresa Gimenez-Julvez. "Assessment of Health Information About COVID-19 Prevention on the Internet: Infodemiological Study." *JMIR Public Health and Surveillance* vol. 6,2 e18717. 1 Apr. 2020, doi:10.2196/18717
- Kouzy, Ramez et al. "Coronavirus Goes Viral: Quantifying the COVID-19 Misinformation Epidemic on Twitter." *Cureus* vol. 12,3 e7255. 13 Mar. 2020

doi:10.7759/cureus.7255

Krause, N. M., Freiling, I., Beets, B., and Brossard, D. 2020. "Fact-checking as risk communication: the multi-layered risk of misinformation in times of COVID-19." *Journal of Risk Research*, DOI: 10.1080/13669877.2020.1756385.

Li HO, Bailey A, Huynh D, et al. "YouTube as a source of information on COVID-19: a pandemic of misinformation?" *BMJ Global Health* 2020;5:e002604. Accessed 10 Nov. 2020.

Mackey, Tim Ken et al. "Big Data, Natural Language Processing, and Deep Learning to Detect and Characterize Illicit COVID-19 Product Sales: Inveillance Study on Twitter and Instagram." *JMIR public health and surveillance* vol. 6,3 e20794. 25 Aug. 2020, doi:10.2196/20794

Marechal, Nathalie, et al. Targeted Advertising and COVID-19 Misinformation: A Toxic Combination. *New America*, 2020, pp. 13-21, Getting to the Source of Infodemics: It's the Business Model: A Report from Ranking Digital Rights, www.jstor.org/stable/resrep25417.5 . Accessed 01 Nov. 2020.

Obiala, Justyna et al. "COVID-19 misinformation: Accuracy of articles about coronavirus prevention mostly shared on social media." *Health policy and technology*, 10.1016/j.hlpt.2020.10.007. 1 Nov. 2020, doi:10.1016/j.hlpt.2020.10.007

Papakyriakopoulos, O., Medina Serrano, J. C., & Hegelich, S. (2020). The spread of COVID-19 conspiracy theories on social media and the effect of content moderation. *Harvard Kennedy School (HKS) Misinformation Review*. Accessed 31 Oct. 2020.

Rovetta, Alessandro, and Akshaya Srikanth Bhagavathula. "COVID-19-Related Web Search Behaviors and Infodemic Attitudes in Italy: Infodemiological Study." *JMIR public health and surveillance* vol. 6,2 e19374. 5 May. 2020, doi:10.2196/19374

Rovetta, Alessandro, and Akshaya Srikanth Bhagavathula. "Global Infodemiology of COVID-19: Analysis of Google Web Searches and Instagram Hashtags." *Journal of medical Internet research* vol. 22,8 e20673. 25 Aug. 2020, doi:10.2196/20673

Sahni, Heena, and Hunny Sharma. "Role of social media during the COVID-19 pandemic: Beneficial, destructive, or reconstructive?" *International Journal of Academic Medicine*, vol. 6, no. 2, 2020, p. 70. Gale Academic OneFile. Accessed 29 Oct. 2020.

Schulman, Roy, and David Siman-Tov. From Biological Weapons to Miracle Drugs: Fake News

about the Coronavirus Pandemic. *Institute for National Security Studies*, 2020, www.jstor.org/stable/resrep23529 . Accessed 09 Nov. 2020.