



Social Media Mis- and Dis-Information:

A Barrier to Public Health Intervention Delivery and Acceptance

Authors

Ana Aleksandric, PhD student, The University of Texas at Arlington (UTA), HIMSS TIGER Intern, HIMSS; Shenita R. Freeman, DSc, MSHIA, MPH, RHIA, CPHIMS, HCISPP, CPH, Senior Director, Analytics & Informatics, Centurion, HIMSS TIGER International Task Force Volunteer; Toria Shaw Morawski, MSW, HIMSS TIGER Staff Liaison; Gabriela Mustata Wilson, PhD, Co-Director, UTA, Multi-Interprofessional Center for Health Informatics (MICHI), HIMSS TIGER International Task Force Co-Chair; and Michael Gaspar, Savvy Cooperative

Introduction

Social media represents platforms used for networking and sharing posts with other users. However, many users leverage social media as information resources (Shearer & Mitchell, 2021). This includes peer-to-peer provider education, health promotion, and healthcare providers sharing scientific and sometimes critical information with the public (Farsi, 2021). Therefore, such platforms help users gain an understanding of public opinion about certain events, as well as the impact of misinformation spread over the network.

Misinformation is “false or inaccurate information that is deliberately created and intentionally or unintentionally propagated” (Wu et al., 2019).

Disinformation is “intentionally false and misleading information shared with the goal of causing harm”; disinformation sources include members of the general public, celebrities, adversarial nation states, criminal organizations, human-trafficking rings, bots, trolls, public and/or governmental officials, and more (al Khaja et al., 2018; U.S. Department of Homeland Security, 2022).

Mis- and dis-information propagated on social media attempts to mislead people by creating chaos around manipulated narratives. For example, linking coronavirus to 5G networks or touting false coronavirus prevention methods related to drinking or gargling cow urine or Hennessy to prevent the infection from reaching the lungs (Posetti & Bontcheva, 2022; Kenya: Hennessy clarifies its drink cannot protect from Covid-19 after influential politician distributes drink to poor claiming it has healing properties, n.d.). Mis- and dis-information use at least four formats in the media according to the United Nations Educational, Scientific and Cultural Organization (UNESCO) (1) false claims that evoke strong emotion, (2) fabricated authoritative figures and websites, (3) fabricated, fraudulently altered, and/or decontextualized images and videos, and (4) artificial amplification of orchestrated campaigns through the use of bots and trolls (Posetti & Bontcheva, 2022). It can be difficult to identify sources of quality medical information, and the spread of false and fraudulent information is a threat to the education of society about ongoing public health interventions and, in some instances, can lead to intervention hesitancy. Additional studies are crucial in providing scientific facts to improve the understanding of the impact of social media activity to reduce intervention hesitancy. Spreading misinformation across the network represents a big threat to public health, and there is an urgent need to educate the public about the benefits of ongoing interventions.

Literature Review Summary

Public health provides one of the most relevant interventions to sustain good health and well-being at the population level. However, interventions must reach a certain acceptance level to be successful. Thus, Sekhon et al. defined *acceptability* as the extent to which individuals deem the intervention appropriate (Sekhon et al., 2017). Another factor potentially impacting intervention acceptability is *health literacy (HL)*, defined as the extent to which 'individuals have the ability to find, understand, and use information and services to inform health-related decisions and actions for themselves and others' (CDC, 2022). Acceptability and HL play significant roles in successful interventions, which can easily be impacted by the misinformation spread on social media.

Vaccine hesitancy is a great intervention example that has recently faced a big issue with its acceptability during the COVID-19 pandemic. There are many research studies conducted to explore COVID-19 vaccine hesitancy. For example, Murphy et al. (2021) conducted a study exploring vaccine hesitancy in Ireland and the United Kingdom (UK). Their results suggest that approximately 1/3 of the population in these countries are vaccine-hesitant. Additionally, a study by Razai et al. (2021) showed that vaccine hesitancy is more prevalent in the UK in ethnic minority groups. Also, low vaccine acceptance is found in the Middle East, Africa, Russia, Italy, Poland, and France (Sallam, 2021). In Portugal, the main reasons behind vaccine hesitancy were mistrust of the healthcare system, job loss, and thinking that the information obtained is contradictory, especially among young adults (Soares et al., 2021). Thus, vaccine hesitancy represents a big threat to public health efforts, while spreading misinformation on social media enhances this already existing problem. Sallam et al. (2021) found that Jordan and Kuwait experience high vaccine hesitancy which is highly impacted by rumors being spread over social media platforms. Vaccination is not the only public health intervention being impacted by spreading mis- and dis-information on social media. For example, there is a statistically significant association between increased tobacco and alcohol consumption and being exposed to social media claims that consuming such products protects from COVID-19 infection (Luk et al., 2020). Another experiment showed that participants expressed a higher desire to purchase e-cigarettes after being exposed to tweets claiming that e-cigarettes are harmless (Wright et al., 2021).

During the pandemic, fearful and anxious people were lured into cybercrime traps under the guise of finding accurate and timely information, services, and/or protection from COVID-19. COVID-19-related mis- and dis-information campaigns related to supply chain, transportation, politics, and potential treatments exploited the global crisis at the nation-state and lone actor level (Zaryn, 2020; Freeman, 2021). These campaigns were launched and circulated by the media and on social media, as described by Seymour et al. in their 2015 article on digital pandemics of public health misinformation. Dr. Julio Frenk,

President of the University of Miami and Former Mexico Minister of Health, stated during an April 25, 2020, news broadcast that “there are communicable diseases and communicated diseases” (Seymour et al., 2015; Cohen & Marquardt, 2020). The proliferation of crime leveraging health and public health increases confusion and mistrust of public health interventions and officials and hinders the provision of services.

As misinformation spread on social media continues to affect public health intervention success, the World Health Organization (WHO) introduced the term *infodemic*. According to the WHO an *infodemic* is “too much information, including false or misleading information, in digital and physical environments during a disease outbreak” (WHO, 2020). UNESCO authors Posetti and Bontcheva coined the term *disinfodemic* because they saw that, “... disinformation creates confusion about medical science with immediate impact on every person on the planet, and upon whole societies; it is more toxic and more deadly than disinformation about other subjects” (Posetti & Bontcheva, 2022).

Health-related risks and harms resulting from infodemics and disinfodemics, spread via social media, foster mistrust towards the health system and authorities, prolong disease outbreaks, and more (U.S. Department of Homeland Security, 2022; WHO, 2020). In addition, the WHO listed five core strategies to enhance the preparedness to respond to health emergencies effectively. They conveyed how *community protection* centers on building trust and providing educational opportunities to community members based on customs and contexts of public health measures (WHO, 2022). Thus, social media providers, influential private companies, and researchers are needed to create infodemic educational offerings, media guidance, and toolkits to help foster and increase communities' trust in the public health efforts, especially during health emergencies, while reducing the effect of mis- and dis-information (U.S. Department of Homeland Security, 2022; WHO, 2022).

Unfortunately, as indicated in the report “National Priorities to Combat Misinformation and Disinformation for COVID-19 and Future Public Health Threats: A Call for a National Strategy” there is no easy way to combat misinformation and disinformation (Sell et al., 2021). “Dis-information poses a national security threat and disrupted communications and computer systems due to ransomware and other malicious cyber activity can result in lost time and diverted resources,” a bipartisan group of senators wrote in a letter to General Paul M. Nakasone (Commander, U.S. Cyber Command and Director, National Security Agency/Chief, Central Security Service) and the Cybersecurity and Infrastructure Security Agency (CISA) director, Christopher Krebs (Hospitals Hacked: Warner, Bipartisan Senators Urge Top Cybersecurity Officials to Protect Public Health Institutions from Foreign Adversaries and Cybercrime. (2020)). This letter that states, “During this moment of national crisis, the cybersecurity and digital resilience of our healthcare, public health, and

research sectors are literally matters of life or death" is an indication of the threat that mis- and dis-information pose to the delivery and acceptance of healthcare and public health services.

Solutions for public health intervention hesitancy seem as simple as performing more research and educating the society. However, it is exceedingly difficult to identify and combat the tentacles of mis- and dis-information spread on social media, which often includes private and encrypted messaging platforms like WhatsApp and Instagram (Posetti & Bontcheva, 2022). Five crucial steps, outlined in the following infographic, are needed to reduce misinformation spread on social media while increasing intervention acceptance.

Public Health Interventions *Acceptance*



Encourage Researchers

Researchers have to be encouraged to emphasize the issues related to the misinformation spread on social media and participate in related research.



Identify Funding

Additional funding resources have to be utilized in order to perform additional research around misinformation on social media.



New Research Projects

Additional research might yield useful facts which can potentially provide a better understanding of social media activity.



Result Interpretation

The results of the additional research should be interpreted in a better and educational way, which can lead to the reduction of misinformation spread on social media.



Reduce Misinformation Spread

Mitigation of misinformation spread on social media would lead to the increased public health intervention acceptance.

An additional step identified by Freeman, S.R. (2021) is the upskilling of the public health workforce to understand cybersecurity and technology better. The evolving information landscape will become increasingly perilous and unchecked without an upskilled workforce. Freeman, S.R. recommends that all types of public health organizations formally recognize internet-based health-related mis- and dis-information as a threat to healthcare and public health and that they incentivize students and professionals to apply health behavior, education, and communications frameworks and theories to help combat its proliferation (Freeman, 2021).

Conclusion

As technology evolves, the number of social media platforms and users is increasing. However, mis- and dis-information spread on such platforms represents a big barrier to successful public health interventions (e.g., vaccination, controlling tobacco and alcohol consumption, etc.) and sustaining overall public health goals. One of the initial steps in enhancing intervention acceptability is the mitigation of the mis- and dis-information spread on social media. One vital intervention is to conduct more research to obtain a better understanding of the influence of social media activity on society, followed by the interpretation of research results that can be used to educate society. Through this approach, along with upskilling the public health workforce, we will be able to reduce the impact of mis- and dis-information spread over social networks, decrease overall public health intervention hesitancy, and learn how we can creatively get ahead of this emerging and ongoing problem.

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