INFLUENCE OF SOCIAL MEDIA ON THE EFFECTIVENESS OF PUBLIC HEALTH CAMPAIGNS AGAINST THE SPREAD OF COVID-19

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Abstract: The increasing spread of the Covid-19 pandemic is paralleled by increasing use of social media for general, positive or negative influences. A systematic review was attempted to evaluate the extent to which research has been done on the three categories of influence of social media and the nature of influence. A search of Google Scholar using the topic of the review itself as the search term, including abstracts also, yielded 32 papers, of which 30 were reviewed under the three categories. More than half of the selected papers were published on the negative influence of social media. Mis (dis) information dominated among the types of negative influences discussed. Many of the papers in all the three categories discussed a few factors related to the observed results. In the case of negative influence, suggestions were given to mitigate the negative influence. This research has implications policymaker and people/organisations responsible for running public health campaigns on social media.

Keywords: Social Media, Public Health Campaign, Covid-19, Pandemic

1 Introduction

Both positive and negative influence of social media in all spheres of life are well known. It is so in the case of the current Covid-19 pandemic also. In the still rapidly increasing scenario of Covid-19 in many countries, it is critical to provide precise information on symptoms, personal protection methods, and methods to prevent spread among the public and other related aspects. Many times, public health authorities communicate this information through social media. On many occasions, administrators of social media pick up these authentic messages on Covid-19 for spreading across the community officially for the broader public good. In a third way, people post messages related to Covid-19, which may be authentic or spurious or self-made. When the information spread through social media is not based on public health authorities, there is a risk of the information being unauthentic, false and harmful. It is common to spread information which looks scientific but without proper evidence. Some of them may even cite authentic sources for such unsubstantiated information. People may post their own beliefs or forwarded messages on what they believe to be true either due to ignorance or purposefully to create harm. All these and more about these dimensions were discussed in a review by Sahni and Sharma (2020).

2 Global relevance of internet and social media

Social media have become agents of fast communication due to rapidly increasing usage of the internet, mobile devices and social media. Some latest data on internet usage given by ITU (2019) is presented in Fig 1.

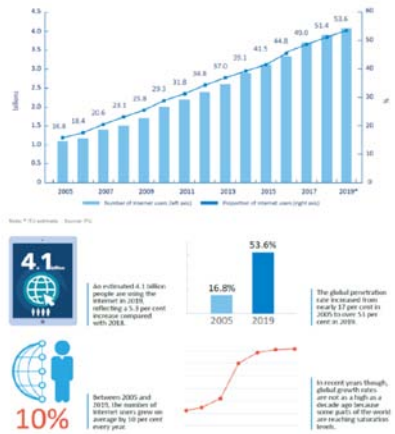

Figure 1 Internet usage trends in the world 2005-2019 (ITU, 2019).

World over, the internet usage steadily increased from 1.2 billion in 2005 (about 17%) to about 4.1 billion people in 2019 (about 54%) of the total population representing an annual growth rate of over 10%. With the increase in internet usage, mobile cellular and active mobile broadband usage also increased at the rate of about 18% annually. Thus, the increase in mobile use has outpaced the growth in internet usage.

The fastest growth can be observed in the case of the spread of social media across all populations in the globe. Some interesting statistics about social media were given by Smith (2019). Out of a global population of about 7.8 billion, about 4.5 billion use internet, 3.75 billion of them are active social media users. Almost 7.5 social media accounts are used per person, and on an average, each user spends about 142 minutes per day in using them. About ten new social media users are added each second. Facebook and WhatsApp are the most popular social media accounting for about 60 billion messages a day and still growing. These facts adequately prove the extent of positive or negative influence social media can exert on the general public.

In this structured review, an attempt is made to evaluate how effective is public health campaigns against Covid-19 under the influence of social media. Both positive and negative influences will be included in the review.

3 Methodology

Google Scholar was used for the search using the topic itself as the search phrase so that papers directly dealing with the topic can be selected easily. Only English language papers were selected. In addition to full papers, abstracts were also included if they contained useful information.

The search yielded 32 usable papers, of which two were used above. The rest 30 selected papers were primarily divided into general, positive influence, negative influence for review of associated aspects. The results of this method of structured review are discussed in the aforementioned sections.

4 Results

As will be evident from the number of papers in the following sections tabulated in Table 1, the frequency of publications was highest in the case of the negative influence of social media.

Table 1. Frequency and percentage of papers used in the sections of this review.

Influence of social media	Number of papers	Percentage
General	7	23%
Positive	7	23%
Negative	16	54%
Total	30	100

Research papers reporting the negative influence of social media comprised more than half of the total number of papers reviewed. Papers of general nature and on positive influence were almost equal in the frequency of about 20-23%.

4.1 General

In this section, papers which cannot be categorised as reporting either positive or negative influences or those which discuss both influences are included. The frequencies of these subcategories are presented.

Table 2. Frequencies of subcategories

General/Non-categorical	Number of papers	Percentage
Beneficial and harmful	4	55%
Non-categorical	2	30%
Nothing specific	1	15%

Both beneficial and harmful influences were reported in more than half the papers reviewed. Two papers generally discussed social media influences. One paper did not say anything specific about positive or negative social media influences.

Social networks can spread either harmful or beneficial behaviours through the network to friends of different layers of relationship (Van Bavel, et al., 2020). Therefore, the need for relying more on the information from authentic public health sources rather than social media or through a general search of the internet was stressed by Li, et al. (2020).

COVID-19 tweets in the United States are largely influenced by political polarisation. Partisan attitudes were correlated with sentiment toward government measures and the tendency to share health and prevention messaging. Cross-ideological interactions were also observed, and this trend was altered by user segregation and polarised network structure. There was a correlation between user engagement with topics related to public health and the varying impact of the disease outbreak in different states. In this respect, Jiang, Chen, Yan, Lerman, and Ferrara (2020) suggested calibration of online platforms to evaluate the effectiveness of public health campaigns. This will help to assess how the state and national level corona policies were received by people. Still, it will be challenging to implement effective prevention strategies across the country, paving the way for almost permanent pockets of high infection rates.

The more positive and crucial role of social media can be beneficial in promoting public health campaigns. However, the effectiveness of this role is met with challenges of posts containing misinformation, lack of guidance, and information leakage. This can be countered only by public health authorities using social media to a large extent for promoting trust, building solidarity of the public with government efforts, reducing confusion and chaos, educating the public on preventive measures and reducing the medical load in sites with limitations of medical facilities (Bao, Cao, Xiong, & Tang, 2020).

Seeing is believing, and the effect of visual media is much more textual messages. Here, social media like YouTube become relevant. In a study, Basch, et al. (2020) found that out of 100 most widely viewed YouTube videos related to Covid-19 over 125 million times, less than one-third dealt with topics related to prevention behaviours listed by US Centre for Disease Control and Prevention website. Thus, an essential opportunity for prevention of the Covid-19 spread was missed.

Twitter is now fast becoming choice social media gaining from leaders like Facebook or WhatsApp. In Twitter, anxious posts related to the spread of the coronavirus is rapidly increasing. Government and health officials select replying only to tweets less troublesome for them. This leaves crucial questions unanswered leaving people more anxious. Governments and their health authorities are content with regular updates on new cases, samples tested, contacts traced, and changes in containment zones. Strategies being followed to contain and control the virus are also posted, but not with adequately clarity to reduce the worries of social media users. Tweets by people show that their worries are centred on the virus contagion, prevention and the economy. However, the tone of official tweets may or may not be soothing enough to assure people that everything is under control. Also, the official tweets may or may not capture the response of public Twitter users to official communications to remove their worries (Rao, Vemprala, Akello, & Valecha, 2020).

Investigations on the content of most-read state-owned newspaper in China, People's Daily posted in an online social media, Sina Weibo by Ngai, Singh, Lu, and Koon (2020) revealed the dominance of non-narrative style in the content frames related to action, new evidence, and reassurance in COVID-19 communication by the government. Posts related to new evidence and a non-narrative style negatively predicted the number of shares. Disease prevention posts delivered in a narrative style were generated the highest number of shares. In an interaction effect, the use of a narrative style in disease prevention posts generated positive comments and likes by the Chinese public and links to external sources enhanced sharing.

4.2 Positive

There were only seven papers out of 30 discussing the beneficial influence of social media. This may mean, either there only very few beneficial influences or research work on beneficial effects are rare, as finding fault is more accessible and more interesting even to researchers. Five of these papers discussed only the direct positive influences true to the section topic. The remaining two discussed some negative influences as also existing but highlighting positive influence. Since there were only two subcategories, no tabulated data is given.

The coronavirus spreads from person to person. In the networks, the centrally located people come into contact with more people and thus, are among the first to be infected. However, the very same central people can slow down the disease by spreading positive interventions like hand washing and physical distancing through public demonstrations. Misperceptions can be corrected to change behaviours through positive public messages of health-promoting norms. Messages from in-group models, influential members of the community, maybe most effective (Van Bavel, et al., 2020).

The success of Vietnam in containing Covid-19 pandemic was, to some extent, due to positive contribution of social media. Facebook and Zalo are the two most popular social media in the country. These media were used to project healthy practices to contain the virus through messages and videos by celebrities. Contributions by them to increase healthcare facilities were also projected (La, et al., 2020).

From a survey of social media users, Al-Dmour, Salman, Abuhashesh, and Al-Dmour (2020) noted positive influence of social media on public health protection against COVID-19 in Jordan. Public health awareness and public health behavioural changes acted as mediators of this effect. The usefulness of mediators in promoting public health awareness and protection of citizens through social media was suggested for practice.

Analysis of Twitter posts in South Korea by Park, Park, and Chong (2020) revealed faster spread and more frequent communication of information in Corona networks than in others. Majority of the content was related to the positive roles being played by individuals and groups, directing attention to the crisis, ethical issues like deviant behaviour among the population and celebrity donations. News in portals was used more frequently than news in nonportal sites. Medically-related tweets were more popular than non-medical tweets.

In Jordan, the use of social media platforms positively influenced public health protection against COVID-19. This relationship was mediated by public health awareness and public health behavioural changes. The recommendation is increased use of social media for enhancing awareness and adoption of recommended guidelines by public health authorities in Jordan (Al-Dmour, Masa'deh, Salman, Abuhashesh, & Al-Dmour, 2020).

The thematic analysis of English tweets during the late half of March 2020 by Thelwall and Thelwal (2020) revealed identified the themes covered in the tweets to be lockdown life, attitude towards social restrictions, politics, safety messages, people with COVID-19, support for key workers, work and COVID-19 facts and news. Twitter played a positive role through official tweets,

sharing of social distancing information and helping others to follow social distancing, criticisms of government responses and helping each other to adjust with social isolation. There were some popular tweets not supporting social distancing, but they seemed to make little impact on the positive effects.

One positive effect of Covid-19 has been recognition, promotion and campaigning for physical activity on a global scale as lack of physical activity is a threat to even general health and is particularly relevant due to movement restrictions and social distancing requirements of the pandemic period. Social media are widely used both by governments and physical activity enthusiasts to spread the message and teach methods of physical activity while following the guidelines. Physical activity is the only reason for people to go out in this period (Levinger & Hill, 2020).

4.3 Negative

Out of 30 reviewed papers, 16 dealt with negative influences of social media. This may be indicative of the natural human tendency of finding fault or high research interest in finding out what went wrong to account for the rapid increase in Covid-19 cases in many countries. The frequencies of papers discussing different types of negative influences of social media are presented in Table 3.

Table 3. Frequencies of different types of negative influences of social media in reviewed papers.

Type of negative influence	Number of papers	Percentage
Misinformation/disinformation	8	15.4
Fake news	2	3.8
Panic	2	3.8
Fear	4	7.7
Uncertainty of future	4	7.7
Racism	4	7.7
Hate speech	3	5.8
Rumours	4	7.7
Conspiracy theories	3	5.8
Hiding real information	1	1.9
Inadequacies	1	1.9
Factors related	8	15.4
Prevention methods given	8	15.4
Total	52	100.0

Note: Total number is higher than 16 because more than one type of influence is discussed in most papers.

More papers dealt with mis (dis) information. Factors affecting and some suggestions for prevention of negative influence of social media were also given by many papers. According to Depoux, et al. (2020), coincidence of virology and virality caused the spread of misinformation and panic through social media faster than the rapidly spreading Covid-19 pandemic itself. Metonymic substitution of incidents and places with restaurants, tourists, products was a specific component of such misinformation. Viral racism against the Chinese and anything associated with them even remotely and later extension of these to all that is Asian were noted. Such negative messages through social media harmed appropriate response to the outbreak. It was also observed that panic created in social media by misinformation, hate speech, rumours, conspiracy theories, fear, racism and mass purchase of face masks, travelled and spread across the world faster than the coronavirus itself.

Negative use and its impact of social media were also noted in Vietnam, more frequently, fake news about celebrities being in physical contact with celebrities. The government intervened to stop these negative impacts by banning fake and harmful news in social media and heavy punishment to those involved (La, et al., 2020).

The negative effects of misinformation and rumours about Covid-19 symptoms, aetiology, effects, cure and prevention in hiding real information through social media were discussed by Tasnim, Hossain, and Mazumder (2020). Prevention of such harmful behaviour is possible only through collaborative efforts of public health authorities, the government and the social media as a group and launch of common platforms for accurate information to the public.

Negative effects of social media infodemic on creating and spreading fear and panic among people of the Kurdistan region of Iraq were reported by Ahmad and Murad (2020). Mental health and psychological well-being or people were affected due to fear and panic. Psychological anxiety was higher among the youth of 18-35 years. Facebook was the most popular media in the region, and messages of fear and panic were posted mainly in this social medium. Gender, age and level of education had a limited effect on the relative use of various social media and therefore impacted also.

Based on the results of a survey in Finland, Farooq, Laato, and Islam (2020) noted that frequent use of social media resulted in information overload and overconcern among individuals. Lowering the perceived cost of responses of preventive measures stressing on the seriousness of the situation can increase the motivation of people to adopt preventive measures such as self-isolation and wearing masks.

Social media are rich in posts of life-endangering consequences of supposed cures, misleading rumours, and conspiracy theories about the origin of coronavirus. These rumours are dangerous and are circulated all over the world. Some of these posts are associated with racism and meant to create fear among the mass. The new infomedia systems are characterised by the several ways of communication between people in which social media occupies a vital place. When misinformation is shared, the harm done surpasses that of coronavirus itself. These social media contain unproven, false techniques to mitigate exposure and infection with misleading information and instruction for individuals to stock up on supplies and food. There is an urgent need to assess the awareness of the public towards the dangerous impact of the spread of misinformation, which can only aggravate the situation (Radwan & Radwan, 2020).

Movement restrictions and social distancing requirements have forced people to rely on social media to maintain connectivity. This is exploited by influential peers to share the information which is not authentic. Sometimes, wrong information is shared unknowingly as in the case of messages forwarded a close friend requesting the apparently 'useful' information for 'everyone's benefit'. When such false information is shared repeated by several people across social media, it is perceived as truth. Thus people become vulnerable to a new digital false reality. A mixture of authentic information from public health authorities and false information spread through social media leads to confusion among people as they tend to compare them and accept what appeals to them as true, often the wrong ones. This confusion leads to a lack of public trust, consensus and prevents positive action from controlling spread by the people.

The term ‘infodemic’ is used to denote the flood of misinformation, disinformation, rumours and false news in the guise of authentic information (sometimes, this information are shown as the statements of some famous authority, whereas in reality, there had been no such statements), the sources of which are difficult to identify. Along with the exponential growth of the COVID-19, the unchecked and rapid spread of misinformation, primarily through social media, is becoming a serious public health challenge for COVID-19 control and mitigation measures (Limaye, et al., 2020). High levels of misinformation about the origin of the coronavirus were also noticed among Portuguese Facebook users, and the frequency of misinformation was higher among those with lower educational attainment (Morinha & Magalhães, 2020).

Considerable public health concerns arise from the currently trending anti-vaccination campaigns through social media, as they threaten even the development of vaccines against coronavirus. This type of vaccine hesitancy affects the public confidence in future vaccine development against novel

pathogens including COVID-19 (Puri, Coomes, Haghbayan, & Gunaratne, 2020).

Types of messages which contain malicious propaganda consisting of hate speech, disinformation, and misinformation are posted in social media to exploit the multiverse of online to spread hate very quickly beyond the control of the administrators of social media platforms. Increasingly coherent, rapidly evolving hate speech content weaponising hate communities, is noticeable. A generalised form of the public health research organisations predicting the point at which the tilting for the multiverse-wide viral spreading of hate speech was modelled. New policies may be required to mitigate the global spread of malicious COVID-19 content, and these policies need not rely on coordination between all online platforms (Velásquez, et al., 2020).

The spread of COVID-19 has led to racism, hate and xenophobia against the Chinese and the broader Asian communities. Spread of both racial hate and counter hate speech to mitigate the spread of racism are seen in social media. Unfortunately, hateful bots had been more successful in attracting followers compared to counter hate bots. Analysis of the social network reveals extensive interaction and engagement between hateful and counter hate users instead of existing in isolated polarised communities. Hate is more contagious, and nodes become more hateful when exposed to more hateful content. In general, counter hate messages can discourage users from turning hateful in the first place (Ziems, He, Soni, & Kumar, 2020).

Social media platforms contain numerous bots that can automatically amplify certain topics of discussion compared to others. A study of 43.3 million English tweets about COVID-19 provided early evidence regarding the use of bots to promote political conspiracies in the United States, sharply contrasting with non-automated posts by persons focusing on public health concerns (Ferrara, 2020).

Covid-19 causes fear, which is aggravated by misinformation and misconceptions carried by social media. The negative influence of social media enhances the psychological distress of individuals as the pandemic spreads rapidly (Lin, Broström, Griffiths, & Pakpour, 2020).

Low confidence and lack of mutual trust between countries and peoples is a fertile environment for the spread of rumours and conspiracy theories through social media. Lack of authoritative scientific consensus on the virus, it is spread, and containment and its' long term social and economic ramifications fuel these rumours and theories. Some examples of such trends are: 5G network activates the virus, the pandemic is a hoax perpetrated by a global cabal, the virus is a bio-weapon released deliberately by the Chinese or Bill Gates is using it for the covert launch a global surveillance regime. Although many people immediately see the true nature of these posts, events such as destruction of property, racially induced attacks against the Chinese and Asian Americans, and demonstrations of resistance to public health orders prove the need to address them sternly.

Computer tools could identify the vulnerable parts of social media posts, and appropriate actions can be initiated against the culprits (Shahsavari, Tangherlini, & Roychowdhury, 2020).

In an analysis of twitter posts during January-April in USA, Wang, Hao, and Platt (2020) found inconsistencies and incongruencies on four critical topics, spatial disparities, problems in timeliness and sufficiency across actors and message types in communicating COVID-19. The network analysis also reveals increased communication coordination over time. These findings could help in future crisis communications on any pandemic or other types of crisis to the public by the government.

5 Conclusion

The above-systematic review shows that negative influence dominates the impact of social media on public health campaigns. Within negative influence categories, mis (dis) information dominated over other types. In all categories of papers, many of them suggested preventive methods to reduce negative influence and strategies to promote positive influence.

This research has implications policymaker and people/organisations responsible for running public health campaigns on social media.

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Primary Paper Section: A

Secondary Paper Section: AJ