CASE REPORT

Journal of Health Information and Librarianship

ISSN: 2408-6614
e-ISSN: 2672-4839

The influence of social media in fuelling health-related disinformation, misinformation, false information and infodemics

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ABSTRACT

Background: The proliferation of health information in Internet-based programming, in particular, social media, has introduced novel challenges for promoting health in society. As such, it is imperative to devise innovative approaches to overcome these challenges. such as social media, health advocates are faced with great challenges of curtailing the spread of false and inadequate information especially in public health emergencies where the lack of verifiable sources of health information may disrupt existing health service delivery. Risk communication is an important health communication strategy, but when it is not properly managed, it degenerates into infodemics. A situation that is very harmful to health promotion. This paper explores the influence of social media on health information promotion and provides a guide to managing information for behavioural change in health promotion. Contents from individual and group pages were purposively selected from two social media, namely, Facebook and WhatsApp. The researchers adopted qualitative content analysis in analysing the data. A few cases, such as the case of chloroquine publicity and incautious use of medical plants as alternative medicine in the prevention and treatment of COVID-19, were purposively selected from WhatsApp and Facebook accounts. The result shows that as relevant as social media is to health advocacy, it is not devoid of spreading unfathomable information to the general public. This degenerates into a case of infodemics which has constituted a clog in the wheel of health promotion. In this contemporary world, where diverse races and nations have been levelled up on the platform of information access through social media tools, the spread of information on health management of an ailment or during an outbreak has often been characterised by a lack of control, quality, and reliability. The report of cases and management of an epidemic on social media tools are usually overblown to the extent that what normally should have been a solution becomes a catalyst for the spread of the initial problem.

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Received: 03 March 2023
Accepted: 25 August 2024

Introduction

Social media platforms play a significant role in the rapid spread of both accurate and inaccurate information during health emergencies like the COVID-19 pandemic. The interconnected nature of these platforms allows information to travel globally within seconds, making it challenging to control the flow of misinformation. Social media algorithms can amplify the reach of sensational or controversial content, further fuelling the infodemic. An infodemic is an overabundance of accurate and inaccurate information that occurs during an epidemic. (Tangcharoensathien et al., 2020). Infodemic management involves coordinated actions to counter the spread of misinformation and promote trusted information during health emergencies. It includes verifying evidence, explaining scientific facts clearly, amplifying the reach of accurate messages through various channels, monitoring the flow of information and misinformation, and coordinating efforts across sectors like health authorities, media, social media platforms, and civil society. The goal is to enable individuals and communities to access reliable guidance and make informed decisions to protect themselves because misinformation can lead to an increase in misleading or incorrect interpretations of the available evidence, thereby impacting decision-making processes (Israel et al., 2022). Moreover, the anonymity and lack of gatekeeping on social media enable the dissemination of unverified information from various sources, including bad actors intentionally spreading disinformation. The ease of sharing and resharing content, coupled with the echo chamber effect, can perpetuate the spread of misinformation within specific communities or networks. It is

against this backdrop that the researchers assessed the influence of social media in fuelling health-related disinformation, misinformation, false information and infodemics. The primary objective of this study was to describe infodemic as aided by social media, while other objectives are to assess the influence of social media in health-related disinformation and misinformation and map out a model for health information specialists in managing infodemic.

Literature Review

Advocacy for health is a major contemporary issue contributing to the development of health promotion practice. It has been described as a "time-honoured role for physicians around the globe," enacting a part of physicians' social responsibility to promote the health of individuals, communities, and populations (Arya, 2013). Although it is deemed essential to clinical practice (Soklandis et al., 2018), it is also enmeshed within the project of advocacy for health promotion as a discipline that should not be left to health workers alone but should be regarded as everybody's business. Advocacy has often been regarded as a key strategy for the achievement of health promotion aims. In public health promotion, social media sites allow individuals to benefit from easy access to preventive medicine; for example, they have social networking accounts on Facebook, Twitter, and MySpace (U.S Preventive Medicine, 2008). The Ottawa Health Decision Centre, in partnership with the Ottawa Health Research Institute, also recently launched a page on Facebook entitled "IShould" in hopes of providing decision aid to a vast population (Ottawa Health Decision Centre, 2009).

Although social media is a popular means of sharing health-related information, there is no consensus on its impact on public health (Schillinger et al, 2020). Nevertheless, amidst the COVID-19 crisis, social media has been characterised as both a harmful purveyor of misinformation and a valuable tool for advancing public health. For instance, on February 15, 2020, WHO Director-General Tedros Adhanom Ghbreyeres raised the concern that Infodemics accompanied the epidemic. Information epidemics are the result of an overabundance of information - some of which is accurate and some not accurate - that occurs during epidemics (Tangcharoensathien et al., 2020). In a similar manner to an epidemic, infodemics spread among humans via digital and physical information systems. It makes it hard for people to find trustworthy sources and reliable guidance when they need it.

Even though rumours and health misinformation have been around for as long as diseases have existed, today's environment is different. The COVID-19 Infodemics has been an unprecedented challenge because we are experiencing an epidemic in a digitalised globalised society. Digitalised tools and technologies have not only changed the way we communicate but have also changed our lives, altering the way we live, work, interact, and build our social identities and sense of community. For example, rumour and information have travelled across borders very quickly and influenced traditional media news cycles and coverage, emotive misinformation travels much more quickly across the digital media than fact-based health information, and epidemic control decisions or controversy in one country can cause debate and comparison with responses in other countries.

In the context of the COVID-19 pandemic, the infodemics are exacerbated by the global scale of the emergency. Even though some misinformation may be confusing, many false and misleading claims, such as those about fake or questionable cures or incorrect recommendations about prevention or public behaviour, can be harmful to life and can exacerbate the outbreak. The infodemics can be even more challenging to manage where health information messages and facts are incorporated into political narrative and online commentary that is not grounded in verified facts and evidence. More so, during the COVID-19 pandemic, the fast pace of new findings necessitated a rush in scientific publishing, and this quick turnaround resulted in new findings that contradicted old ones, and news became outdated more quickly than ever before. Some different claims and proposals originated from various

scientists. For example, some scientists opposed lockdown but believed that young people who are more infected should attain herd immunity (the Great Barrington Declaration), whereas others counterargued this position (the John Snow Memorandum). Due to the evolving research, prominent scientific journals such as The Lancet and The New England Journals of Medicine had to retract articles.

However, with this flux of ever-changing and conflicting information, combined with "fake news" and conspiracy theories, it has become difficult to separate fact from fiction because social media provides a platform for everyone to voice their opinions, which further aids the spread of fake and triggering information (Cinelli et al., 2020). An example is the heated controversy over the hashtag #InjectDisinfectant on Twitter, which trended in April 2020 after the former President of America, President Donald Trump, held a daily briefing suggesting that people inject disinfectant to treat COVID-19 (Clifford, 2020). In another example, an invalid article claiming similarities between COVID-19 and human immunodeficiency virus was featured in > 17,000 tweets and picked up by 25 news stations before it was quickly retracted, this shows how rapidly incorrect information can spread (Kelland, 2020). Also, the effect that influential individuals have on public perception goes a long way in influencing outcomes of interest or physiological responses of people about health-related topics. For instance, President Trump's Twitter influence increased by 300% when he tweeted about unproven therapies, such as hydroxychloroquine and chloroquine (Niburski & Niburski, 2020). These therapies were frequently used in search engines, and online sales for those items and other substitutes increased by > 200%. This illustrates the effect that influential individuals can have on public perception, even when they lack adequate scientific backing. In addition to textual information and misinformation, visual information can be presented alongside written or verbal information misleadingly – even though the visual information is not false, just out of context. Out-of-context visuals offer a low-tech path to misinformation that can still be influential (Fazio, 2020).

Misinformation, generally considered, is an important area of research in health communication (Krishna & Thompson, 2019) and communication as a field more generally (Southwell et al., 2018). The public information environment around COVID-19, at this point, seems to feature primarily this unverified information. Such spread of conflicting information can have a destructive effect on people's behaviour and health. Misinformation beliefs tend to be associated with fewer preventive behaviours or compliance, possibly resulting in a heightened risk of infection. Information overload also leads some people to experience heightened anxiety and sleep disturbance (Cheng et al., 2020). Those who lack the education or health literacy to differentiate between reliable medical advice and false information may be especially vulnerable (Siebenhaar et al., 2020). People need accurate information during an epidemic to modify their behaviour and protect themselves, their families, and their communities against the infection. An infodemics cannot be eliminated, but it can be managed. The management becomes more challenging with social media and the rapid spread of information. Against the backdrop of the increasing use of social media, the researchers have presented a framework that can guide and support the investigation and assessment of the role of social media in promoting health. The framework provides a systematic approach to understanding the complex relationship between social media and health promotion by identifying the key factors that influence the use of social media for health promotion. It also offers a comprehensive set of guidelines that can be used to design, implement, and evaluate social media-based health promotion interventions. The framework is expected to contribute to the development of effective and evidence-based social media strategies that can improve health outcomes and promote healthy behaviours.

Methods

A community-driven approach was used for building the paper list in this literature review. The researchers collected the data for this study through the review of social media content and online video content from public social media reports on selected disease outbreaks and their recommended controls or management. Contents from individual and group pages were purposively selected from two social media; Facebook and WhatsApp. The researchers adopted qualitative content analysis in analyzing the data collected. More so, literature was reviewed and it was done using various online tools with relevant information including, PubMed, Google Scholar and the World Health Organisation (WHO) online publications. The literature search was conducted after two major steps; (i) search formulation, where the topic was analysed to give key concepts (Health Advocacy, Health promotion, Infodemics, social media), and (ii) Use of the identified keywords in step (i) to search the PubMed, Google scholar, and WHO database. The searches were restricted to publications not older than ten years. Only search results that were found relevant to the topic were selected and used.

Results

The Role of Social Media in Health Advocacy, Infodemics Management: Propaganda on Selected Disease Outbreaks and Their Propagation as Aided by Social Media

Social media platforms like Twitter, Facebook, YouTube, and Instagram are critical in disseminating health misinformation, with the proportion of health-related misinformation on these platforms ranging from 0.2% to 28.8% (Israel et al., 2022). These platforms play a significant role in spreading misleading or incorrect interpretations of available evidence, impacting mental health, misallocating health resources, and increasing vaccination hesitancy. With the emergence of these new technologies, information flows through additional channels of communication, further filtering into people's lives." However, the experiences from the HIV, Ebola, Zika, and Polio epidemics and the COVID-19 pandemic have demonstrated the cost to public health and health systems when rumour and misinformation are amplified in an environment where there is already a high level of distrust, which is aggravated by a poor public health communications response like in the cases below.

The case of Chloroquine publicity

The hydroxychloroquine (HCQ) publicity during the COVID-19 pandemic is a perfect example. HCQ, a lyso-somatotrophic agent, is an approved drug to treat malaria and some autoimmune diseases. Its propensity to fight certain viruses is explained by its role in blocking the function of lysosomes. It is postulated that at an acidic pH, certain viruses, after being internalized through the plasma membrane of cells, can fuse with lysosomal membranes, thus entering the cells and replicating. Chloroquine, a weak base, enters into lysosomes and raises the pH of the lysosome. As the pH rises, lysosomal enzymes fail to function, and viruses requiring acidic pH can no longer enter the cells. The productive role of chloroquine against SARS-CoV-2 has been demonstrated in vitro (Agarwal et al., 2020). However, the efficacy of HCQ in humans is yet to be determined. The first trial was done by Chinese investigators, followed by French, which showed the drug's efficacy in the duration of symptoms, radiological picture, and hospital stay. These trials were limited, non-randomized, and done on a small scale. Currently, several big pharmaceutical companies are pursuing the treatment and prevention of the novel coronavirus. However, aside from remdesivir created by Genentech, we do not have a promising drug for COVID-19 treatment. Thus, when chloroquine appeared as a hope, it sparked the interest of the media as a potential cure. Some politicians created hype and promoted chloroquine by declaring it effective against the novel coronavirus and referred to it as the 'biggest game-changer in the history of the world' (Nigerian has chloroquine, 2020).

The misstep or honest mistake proved hazardous for the public as many deaths were reported because of its overuse as the safe dosage in COVID-19 was unknown. In Arizona, a man died after using chloroquine as a self-medication while his wife got

critically ill, and at least two people were reported to have overdosed on the drug in Nigeria (Gautret et al., 2020). Hydroxychloroquine is very cheap, affordable, and easily available in malaria-endemic regions, and became highly sought after following its publicity on several media platforms. Within a short period, chloroquine was portrayed over social media as a wonder drug with a coronavirus cure, misleading the public about its effectiveness and rendering negative consequences. This shows that politicians should not be allowed to provide scientific information to the general public, especially using the media as a platform.

The Case of Social Media Publicity on Incautious Use of Medicinal Plants as Alternative Medicine in the Prevention and Treatment of COVID-19

The worldwide outbreak of Coronavirus disease (COVID-19) started in November 2019, and the pandemic has since continued, with new waves emerging periodically in some continents of the world till 2022. Since its inception, there has been overblown or exaggerated news aided by social media about the use of medicinal plants such as lemon, lime, garlic, ginger, pineapple, and orange peels in no appropriate measure for the prevention and treatment of COVID-19. Social media users woke up to all forms of news giving information on how to combine these medicinal plants for concoctions of alternative medicine to prevent and treat COVID-19. This information was widely circulated on social media and, in turn, had a great influence on the users who swung into practice without authenticating the information or weighing the side effects of such concoction.

However, there has not been any scientific confirmation of these medicinal plants as an appropriate alternative for the prevention and treatment of COVID-19. According to the National Center for Complementary and Integrative Health, *"…there is no scientific evidence that any of these alternative remedies can prevent or cure COVID-19*. Some of them may not be safe to consume. It is important to understand that although many herbal or dietary supplements (and some prescription drugs) come from natural sources, "natural" does not always mean that a product is a safer or better option for your health.". Observantly, this is one of the warnings rarely circulated via social media; when such surfaces, it is usually ignored or criticised by social media users.

The Case of Social Media Publicity of Anonymous WhatsApp Broadcasts on the Use of Phytomedicine for Prevention and Management of Diseases

Over the years, campaigns on using herbal plants for the prevention and management of all kinds of diseases have flooded social media. One of the common features of such information is "anonymous writer" thereby making the sources unverifiable. It has been observed that many social media who have access to this kind of information bother less about the authenticity of such information before swinging into actions on using phytomedicine as a home remedy for the prevention and management of diseases. These unverified broadcasts have gained the status of "forwarded many times" on numerous WhatsApp groups indicating that it has been received by thousands of WhatsApp users. The list below, which has been widely shared on WhatsApp groups, contains an array of diseases such as typhoid fever, stomach ulcer, asthma, rheumatism/arthritis, cholera, high blood pressure, pneumonia, tuberculosis, and diabetes and how they can be cured using medicinal plants. As a norm peculiar to such broadcasts, the author is sometimes unknown, and we shall look at a few of the highlighted diseases and the recommended herbs:

"I can't keep this piece to myself alone. It's forever going to be useful, even for our unborn generations. It is for keeps.

"I advise you to print and keep it in a file captioned Health Issues just like am going to do after forwarding it to you all."

"LEARN TO BE YOUR DOCTOR

1. TYPHOID FEVER.

Get unripe pawpaw, unripe pineapple, ginger, lime orange, and Lipton tea. Cut into pieces, and boil with fermented corn water for one hour. Take one glass cup 3 times daily for one week. The ailment will disappear.

2. STOMACH ULCER. Get 7-8 unripe plantains, peel them, cut them into pieces and pound. Put everything inside a plastic container, and fill it with one gallon of water. Allow it to ferment for three days. Take one cup 2 times a day for one week. The ailment will disappear.

3. ASTHMA.

Get some seeds of mango, cut them into pieces, and keep them under the sun to dry. Grind to powder. Put one spoon of the powder into a glass cup of water, stir it, and drink. Once in a day for 3-4 weeks.

4. RHEUMATISM / ARTHRITIS

Get 5 seeds of English pear (Avocado pear), cut them into pieces and dry them under the sun, grind them to

powder. Mix with a glass of honey to form a paste. Take one spoon, 3 times daily until the 6th day.

5. CHOLERA

Take three teaspoons of salt and one teaspoon of sugar, and add half a spoon of dry gin. Drink all as a single dose. Cholera will stop immediately.

6. HIGH BLOOD PRESSURE.

Get 4 seeds of English pear (Avocado pear), cut them into pieces, dry them under the sun, and grind them into powder. Put a teaspoon of this powder into your prepared palp and drink. Once daily for 2 weeks." (Sourced from a WhatsApp group)

The Case of Social Medial Publicity on Using Mixture of Snail Slime and Hollandia-Evaporated Milk to Cure Stroke

On May 9, 2022, a video was posted on the Facebook account page of "Iyen Na Nice" (Facebook, 2022), urging the intended viewers to keep the video in their archive as it will prove useful one day. The video has a man in the market claiming that the fluid from snails (Snail slime) and Holland milk can cure partial or full stroke. In the video, a man began his health campaign by analysing four types of headaches. According to him, when a headache occurs from the forehead to the back of the head, it means the affected person is suffering from malaria, and he advised the person to get a malaria drug and use it. He also said that if the headache occurs at the right part of the head, it indicates a lack of sufficient sleep, and he advised that the affected person should get proper sleep. He further stated that if the headache occurs on the left side of the head, it indicates high blood pressure in the affected person. He said if the headache persists and leads to loss of energy in the affected person such that the ache is now being strongly felt at the back of the head (occipital lobe), causing severe pain at the back of the neck, he claimed that this is a pointer to stroke within 14 days.

The man in the video revealed that to cure anyone with a stroke, all that is needed are a snail, five leaves of bitter leaf, and half a tin of foreign milk known as Hollandia evaporated milk. In his instruction, he explained that the shell of the snail should be broken to be able to collect its slime into a cup. Then, five leaves of the bitter leaf plant should be soaked and squeezed inside the snail slime, and half a tin of the Hollandia milk should be added to the mixture and stirred well with a spoon. Then, the person suffering from the stroke should be made to sit down while the mixture is being given to him or her to drink. He affirmed that immediately after the person who is suffering from a stroke drinks the mixture, his hands and legs will begin to shake, and at the same time sweat profusely. He explained further that after 3 hours, the affected person will fall asleep and by the time he or she wakes up, he will be able to walk freely. However, he left a warning that the person who has just been cured of a stroke using snail slime, bitter leaf, and Holland milk should be told never to taste any soup with Maggi and salt again as these can lead to reoccurrence of the stroke. The post which is over a year old has recently been circulated by other Facebook users and the video has been forwarded many times to various WhatsApp groups containing hundreds of members. This post has attracted over 35,000 shares, more than 2,700 likes, 985,000 views, and over 27 comments showing acceptance of the message. (Facebook, 2022).

However, a source who has a similar claim that a stroke can be cured using snail slime and evaporated milk was reportedly countered in an article published in Nigerian Tribune Newspaper

(September 8, 2021) titled "Experts Say Mixture of Snail Slime, Evaporated Milk Cannot Cure Stroke" (2021). However, this counter-warning has not gained much circulation on social media as the one approving the claim.

The imminent dangers that often lie in such information as above include the fact that recipients of such broadcasts do not take time to medically weigh options before they start practicing the instructions contained in the broadcasts. This has led to dangerous self-medication practices influenced by social media. Dosage error has also become another dangerous feature as the various target users may be demonstrating different levels of the same ailment and the same measure of the concoction has been recommended in the message circulated on social media. More so, the social media canvassers (oftentimes, anonymous) of these phytomedicine messages do not have any knowledge of the health status or underlying ailments of their target audience. This, in so many instances, has led to complications in the health of many people who follow the instructions contained in such information.

The Case of Social Media Publicity of the Claim that Hot Pineapple Water Defeats Cancer

Another instance of health infodemics that has also enjoyed viral circulations among various groups on WhatsApp is a claim that hot pineapple water cures cancer. In the viral message circulating on WhatsApp groups, it was said that it has been confirmed that adding a few slices of chopped pineapple to hot water and drinking this mixture can help boost the body's ability to fight or defeat cancer. This claim has gone viral on social media, notably WhatsApp, with the status of "forwarded many times (FMT)" since 2021. Though this claim has been refuted in an online article published on a privately owned website known as "News Checker", it still enjoys wide circulation and acceptance among social media users especially, the WhatsApp users, till today. For details of the content (see Appendix I).

VARME Framework

VARME (Validation, Awareness, Relationship, Mobilization, and Evaluation): A Framework for Managing the Negative Influence of Social Media Infodemics on Health Advocacy.

Social media has become an important tool in health promotion. Engagement with advocates is a fundamental element in health promotion and advocacy and social media provides a platform for new supporters and the general public to become aware of the important issues (Guo & Saxton, 2013). However, to investigate the impact of social media on health promotion and advocacy, the VARME model (Validation, Awareness, Relationship, Mobilization, and Evaluation) will be of great assistance to health information specialists. The model suggests the following four major concepts for effective and quality health information and advocacy promotion via social media platforms:

1. Validation: the menace of social media infodemics can be drastically rooted out through information validation or verification by the receivers. Information validation aims to carry out due diligence in authenticating information. Information validation anchors on originality, source, time, setting, and motive. These five factors are to be crucially considered when fact-checking is being carried out on circulated social media information. Free online and offline health information validation services that are easily accessible to social media users will help immensely in curbing the menace of infodemics on social media. Of relevance is also an amplified awareness targeting the social media users on how to explore available health information validation service tools to detect earlier any health misinformation and curtail its spread in the community

2. Awareness –Critical awareness plays a crucial role in health promotion initiatives. This process involves developing a comprehensive understanding of an issue to encourage active involvement and support. Health information professionals must identify communication channels that are easily accessible and frequently used by their intended audience, including social media platforms. Proficiency in digital media is

imperative for engaging priority populations in their physical, social, and online environments, thereby bringing about significant transformations. Therefore, acquiring digital media expertise is essential for maximizing the effectiveness of health promotion interventions.

3. Relationship: The delivery of health information to its intended audience is the responsibility of health information specialists. To engage with their audience, they use digital media and communication tools, including social media management platforms. Specialists must stay up-to-date with new social media platforms and emerging communication tools to build relationships with their intended users. It is also crucial for them to have a social media policy that outlines guidelines for topics such as hashtag use, tagging, communication, and content updates. An official social media policy can help prevent negative posts that harm online communities. The HESPA II 2020 guidelines encompass these competencies and sub-competencies. (Bensley et al., 2020; CDC, 2023).

4. Mobilization: The prompt response to health information infodemics can be effectively enforced through both online and offline forms of social media engagement (Scott & Maryman, 2016). In this regard, a comprehensive approach to address the issue of infodemics necessitates the deployment of an integrated strategy that leverages social media as a tool for creating awareness and driving engagement. The implementation of such a strategy would not only facilitate the timely and effective dissemination of accurate health information but also help mitigate the negative impact of misinformation and rumors. Thus, a coordinated effort that combines the benefits of both traditional and modern forms of communication is crucial for combating the issue of health information infodemics. Social media platforms provide a convenient and centralized location for both synchronous and asynchronous communication, fostering transparency and accessibility. These digital tools present an excellent opportunity to expand the scope of advocacy campaigns and engage stakeholders to support public health causes, regardless of their location or availability (Satariano & Wong, 2012).. To keep social media pages active and engaging, it is crucial to have skilled moderators who can schedule messages and respond to user posts about current public health concerns. These moderators provide invaluable social support, such as sharing tips on how to communicate effectively with healthcare providers, which Doctors may not always be available to offer (Bensley et al., 2019).

5. Evaluation: Evaluation is a crucial aspect of social media initiatives in the field of health promotion. This process involves assessing various factors that impact the success or failure of social media usage, including tracking social media analytics and performance indicators. The most pertinent form of evaluation is analyzing social media usage as part of an intervention or as an independent tool (Guo & Saxton, 2013). The data gathered from evaluation empowers key decision-makers and other stakeholders to monitor program inputs, such as messages, videos, and chat sessions, as well as outputs like the number of followers, likes, and comments left on social media posts (Zhao & Zhang, 2017). This information is essential in determining the effectiveness of social media activities, offering valuable insights into the drivers of engagement, and pinpointing areas for improvement. Therefore, evaluation is a critical element in maximizing the influence of social media as a health promotion tool and is a fundamental part of any social media strategy.

Conclusion and Recommendations

In a world of ours where diverse races and nations have been leveled up on the platform of information access through social media tools, the spread of information on health management of an ailment or during an outbreak has often been characterized by a lack of control, quality, and reliability. The report of cases and management of an epidemic on social media tools are usually overblown to the extent that what normally should have been a solution becomes a catalyst for the spread of the initial problem.

To achieve the aims of health advocacy and health promotion, health information should be devoid of infodemics which has become a menace that needs urgent curbs in our society. Alongside developing metrics to capture the health burden of infodemics, we need to move towards building systems and societies that are resilient to infodemics, so that the burdens are minimized. However, there is an urgent need to integrate health literacy, including education, on how to search for and assess information from an early stage, just as the importance of healthy foods and healthy lives are now a routine part of primary education.

However, in combating infodemics, the government, public or private health agencies, and technology platforms have key roles to play. These include:

i. There should be even application of infodemics management to both virtual communication space and the physical world as individuals and communities move between both to obtain information daily.
ii. There should also be collaboration across stakeholder groups (health authorities, the private sector, academia, civil society, and the media) to issue effective infodemics management responses.
iii. There should always be swift and viral counterclaims against any misinformation or disinformation about an outbreak or management of any health-related issues.
iv. The infodemics managers should be proactive and timely in their actions to prevent any occurrence of health infodemics in society rather than employing damage control tactics after the deeds have been done.
v. There should be enhancement of social listening platforms to better understand and meet the concerns and information needs of individuals and communities.
vi. Improvement of media and digital health literacy to reduce vulnerability to infodemics.
vii. To aid health information verification, effective awareness of online fact-checker tools such as should be created for social media users in virtual and physical spaces for a standby debunk of health misinformation to promote genuine health advocacy.

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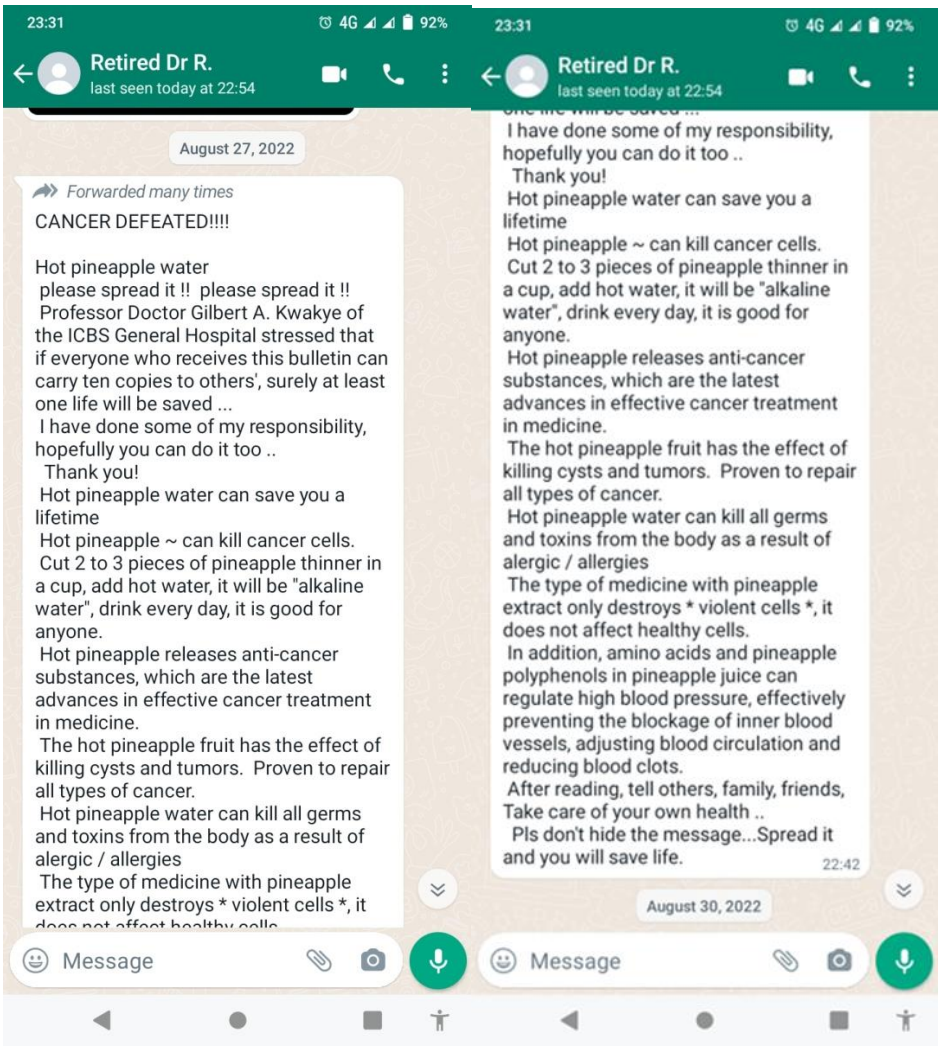
Appendix I



Social Media Claim That Hot Pineapple Water Defeats Cancer