Dispelling Fake News and Infodemic Management about COVID-19 Vaccination: A Literature Review

ABSTRACT

Background and Objectives: Due to the uncertainty that arises during a disease outbreak, conflict, or natural disaster, crises are fertile grounds for sowing false information. In this context, an infodemic may arise from an excess of information in general, a lack of reliable information, or an increase in misinformation and disinformation. The purpose of this study was to look into the actions for dispelling fake news and managing infodemic about the COVID-19 vaccination.

Materials and methods: The literature search for this narrative review was conducted using English databases of Cochrane Library, PubMed, Scopus, and Science Direct, as well as Persian databases including Magiran and Scientific Information Database. In addition, the World Health Organization, the reports of the Center for Disease Control and Prevention, the United Nations Population Fund (UNFPA), and The United Nations Educational, Scientific and Cultural Organization (UNESCO) were also searched over. The search was carried out from December 2019 until May 31, 2022.

Results: Combating health misinformation would necessitate a collective effort from all sectors of society. There is sufficient knowledge that misinformation is a serious problem and its solution requires a joint and collective effort. Key actions to combat infodemic were categorized from micro to macro. These levels include individuals and families, educators and educational institutions, health professionals, researchers, social media professionals, media organizations, and the government.

Conclusion: Because of the unique nature of COVID-19 and the flood of misinformation and fake news surrounding the pandemic, we believe that traditional actions limited to governments and healthcare institutions will not be adequate to successfully receive the common people's vaccination and reduce vaccine hesitancy. The best approach to combating health disinformation is to acknowledge that different levels of society, from micro to macro, must realize that this is their moral and civic role, and that they must hold themselves accountable.

Paper Type: Research Article

Keywords: Vaccination, Vaccination Hesitancy, Disinformation, Infodemic, COVID-19 pandemic, COVID-19 vaccines.

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Introduction

COVID-19 was reported by the World Health Organization (WHO) as a pandemic in 2020. It is the largest global public health crisis in a century, with overwhelming health and socioeconomic consequences (1, 2). Currently, no curative treatment exists for the COVID-19 infection (3). COVID-19 immunization has been identified by the World Health Organization (WHO) as the safest method of eliminating the COVID-19 pandemic (4). Therefore, a safe and effective prophylactic vaccine is urgently needed to contain the pandemic, which has had devastating medical, economic, and social repercussions (5). To date, several vaccines have been developed and approved for emergency immunization (6, 7). Vaccination programs can lead to herd immunity without requiring a substantial proportion of the community to be infected. However, such immunity requires a sufficient proportion of the population to be vaccinated. While vaccination is effectively recognized as an effective way to reduce and eliminate the burden of COVID-19, its effectiveness depends on the population's willingness to be vaccinated. Immunization programs are only successful when there is a high acceptance rate of the vaccine (8-10).

Global immunization distribution attempts have been underway for some months as of September 2021, with variable degrees of success. In addition to the logistical challenges associated with vaccination distribution to the general public, vaccine apprehension among some groups of the community remains a problem. Vaccine hesitancy was on the rise before the COVID-19 pandemic and the WHO labeled it one of the top ten dangers to world health in 2019 (11). An analysis of Tweets regarding the COVID-19 pandemic showed that 24.8% and 17.4% included misinformation or unverifiable information, respectively (12). The CDC mentioned vaccination rates were lower among reproductive-aged adults, with approximately 60% of adults aged 18–39 years fully vaccinated (13). Therefore, with the availability of these vaccines, countries are faced with various challenges, including vaccine hesitancy and anti-vaccination sentiments, limited global supply, and inefficient vaccine deployment (14, 15). Aside from a safe and efficacious vaccine and a well-coordinated health service to execute vaccination (two crucial aspects), public acceptance and confidence in the vaccine is a third important component (16). During the COVID-19 pandemic, people have been exposed to a great deal of information: news, public health guidance, fact sheets, infographics, research, opinions, rumors, myths, falsehoods, and more. The World Health Organization and the United Nations have characterized this unprecedented spread of information as an "infodemic" (17). People were exposed to a lot of information during the COVID-19 outbreak, including news, public health recommendations, fact sheets, graphics, investigations, views, rumors, misconceptions, lies, and more. The WHO and the United Nations (UN) have called this extraordinary dissemination of information an "infodemic" (17). The WHO defined an infodemic as being an "overabundance of information, some accurate and some not, that occurs during an epidemic, which can lead to confusion and ultimately mistrust in governments and public health response (18)."Due to the uncertainty that arises during a disease outbreak, conflict, or natural disaster, crises are fertile grounds for sowing false information. In this context, an infodemic may arise from an excess of information in general, a lack of reliable information(19), or an increase in misinformation and disinformation (20). "Misinformation is a pandemic in itself" (21). Unverified information can cause harm by sowing

confusion and drowning out accurate health information; it can change behavior, including panic-buying or consumption of dangerous and unproven treatments (20); it can shape attitudes towards vaccines (22). Infodemics adversely affect the response to the pandemic and amplify its negative implications through a myriad of processes (23). It has also led to violence and hostility toward public health workers, medical professionals, and other frontline workers whose jobs it is to explain new public health initiatives (24, 25).

Anti-vaccine activists would then, without a doubt, use any opportunity to sway public opinion. False claims that vaccine administration alters human DNA, cause irreparable harm to human health and contains human immunodeficiency virus particles or implant tracking chips are examples of this (9). There is a call for more research to find and stop COVID-19 fake news. But these efforts are hampered by things like a lack of deeper understanding of the particular COVID-19 fake news themes, and the fact that there aren't any good Artificial Intelligence (AI) tools for finding COVID-19 at the system level (26).

The World Health Organization has called for "Member States to develop and implement action plans to manage the infodemic by promoting the timely dissemination of accurate information, based on science and evidence, to all communities, and in particular high-risk groups; and preventing the spread, combating, misinformation, and disinformation while respecting freedom of expression (27)."

There has been research conducted on fake news and infodemics in COVID-19, which has primarily focused on the ideological constructs, roles, and consequences of it on individuals and society (28-30). When it comes to the COVID-19 vaccination, not many studies have been done on how to deal with an infodemic. Most of the

actions in these articles are for social media and online platforms, and strategies for all levels are not mentioned (31-34).

The purpose of this study was to look into the actions for dispelling fake news and managing infodemic about the COVID-19 vaccination.

Method

This review study was written using the Scale for Assessing Narrative Review Articles (SANRA) to examine the strategies for dispelling fake news and infodemic management about vaccination COVID-19. SANRA is made up of the following six components: 1) explanation of the significance of the article to the reader; 2) the objective of the narrative review; 3) a complete description of the literature search; 4) referencing; 5) incorporation of relevant evidence, and 6) proper data presentation.

Methods and strategies for identifying guidelines and studies in the review

The research question was "What can be done at various levels for dispelling fake news and managing infodemic about the COVID-19 vaccination?" The databases examined for related documents included Cochrane Library, PubMed, Scopus, and Science Direct in English, as well as Magiran and Scientific Information Database in Persian (SID). In addition, WHO, the Centers for Disease Control and Prevention (CDC), the United Nations Population Fund (UNFPA), and, the United Nations Educational, Scientific and Cultural Organization (UNESCO), guidelines and instructions to fight against misinformation about vaccination COVID-19 were searched. To identify additional references, the reference lists of the relevant publications were also checked. The following keywords were used in the search:

misinformation, disinformation, ideology, fake news, social network analysis, infodemic, anti-vaccine, AND vaccination, vaccine, vaccine

hesitancy, COVID-19 pandemic, or coronavirus pandemic. Boolean terms (AND/OR) were used to separate keywords and medical subject headings (MeSH) to improve the accuracy of searches.

To collect all of the relevant literature and documentation on actions and strategies to resolve vaccination hesitancy of COVID-19, the studies of design were not restricted. The search was performed from December 2019 up to 31 May 2022.

Criteria for studies and guidelines eligibility

In the present study, the target population (P) included adults with age >18 years old and of any ethnicity, the intervention / exposure (I) included fake news or infodemics of Covid-19 vaccination, and the outcome (O) considered as vaccination hesitancy or non-vaccination. In the present study, there was no comparison (C) and type of applied study (S).

Therefore, the inclusion criteria included the following: a) The articles revealed evidence of resolving vaccination hesitancy in the COVID-19. b) The guidelines provided evidence for vaccination promotion actions during the COVID-19 pandemic. Excluded were studies and guidelines If: a) The documents and articles were not written in English or Persian. b) The full text of the article was not available. c) The articles revealed evidence of combating only the COVID-19 pandemic and do not mention COVID-19 vaccines. c) The article appeared in the form of a letter to the editor or a conference abstract.

Study Management and Data Extraction

To confirm the inclusion criteria, two authors (ML and EM) examined the titles and abstracts of all retrieved publications (guidelines and studies). They have chosen the data about actions for tracking the COVID-19 vaccination fake news and extracted it separately. Narrative synthesis was used to describe the results of the included publications.

A third researcher was engaged in addressing any inconsistencies. At this point, the authors didn't have any disagreements. The extracted data was classified and presented as action strategies at six levels, including individuals and families, educators and educational institutions, health professionals, researchers, social media professionals, media organizations, and government.

Results

The literature search identified 5419 potentially relevant studies and 147 guidelines. After a review of the titles and abstracts of all the records, 1796 articles and 21 guidelines were excluded from the analysis as they did not meet the inclusion criteria. Finally, 11 studies and 7 guidelines were included in the review (Figure 1). All of the included articles and guidelines were published in 2020-2022. Eleven included articles were from European countries (32, 35, 36), the United States (26), Asia (37), Africa (38, 39), and four were multi-country (29, 40-42). The design of all articles was review of the literature. The included guidelines were related to WHO (27), UNICEF (43), Surgeon General of the U.S (44), The National Academies of Sciences, Engineering and Medicine (NASEM) (45), Department of Health Policy and Management and Institute for Vaccine Safety, Department of Health Policy and Management, School of Public Policy, Department of Health Behavior, Center for Infectious Disease Modeling and Analysis, Department of Internal Medicine (Infectious Diseases), Texas Children's Center for Vaccine Development, Department of Biology of several American universities including Johns Hopkins school of public health, Baylor college of medicine, and Yale school of public health (46), and finally National Institute of Mental Health (NIMH), National Institute of Allergy and Infectious Diseases (NIAID), and National Center for Complementary and Integrative Health (NCCIH)(47).
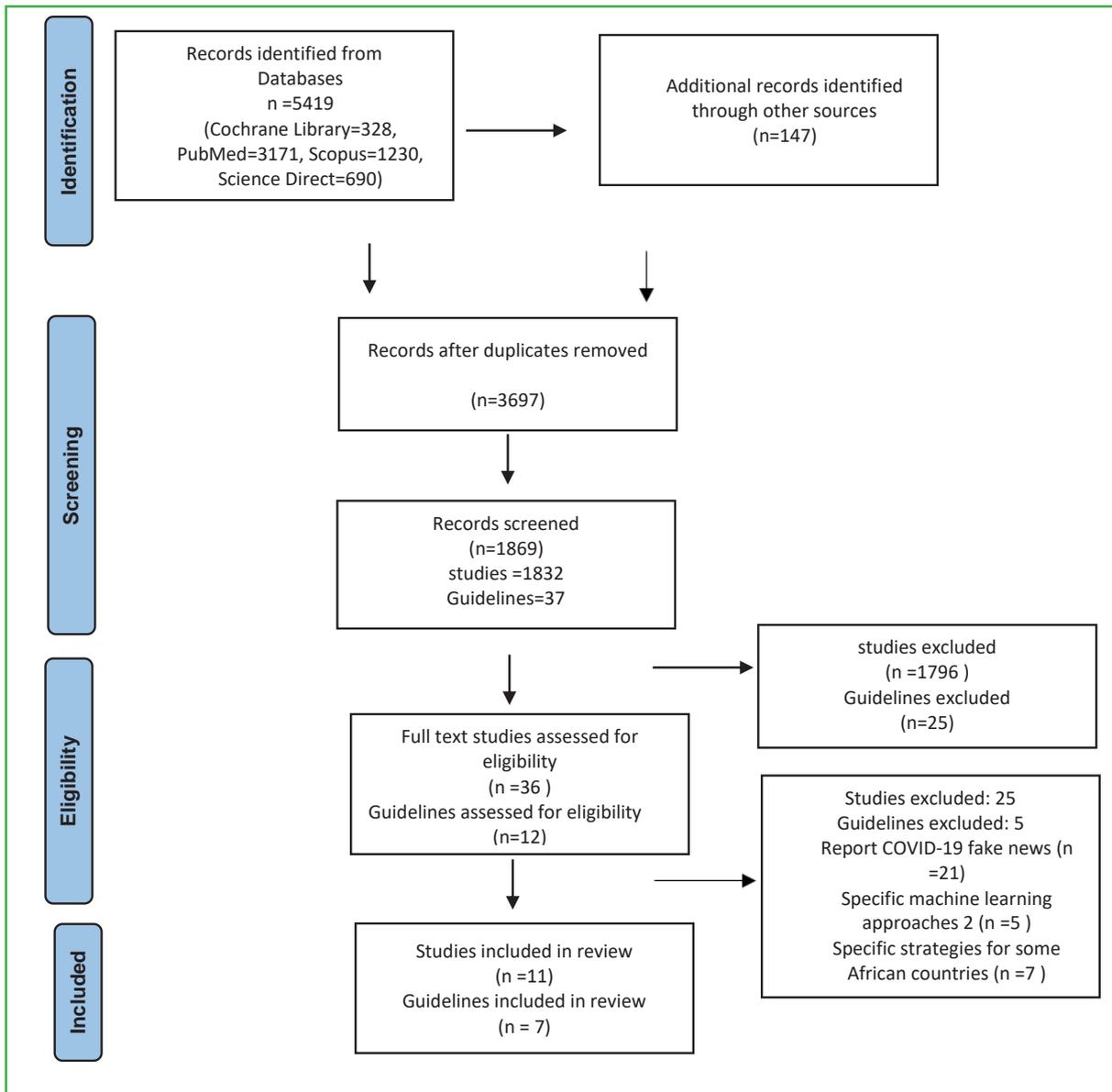
Figure 1: Flow chart of the literature selection process

According to the literature review, identifying health misinformation would necessitate a collective effort from all sectors of society. There is sufficient knowledge that misinformation is a serious problem and its solution requires a joint and collective effort (48). Key actions to combat infodemic were categorized from micro to macro. These levels include individuals and families, educators and educational institutions, health professionals, researchers, social media professionals, media organizations, and the government.

Youth, religious leaders, community stakeholders, religious groups, and schools can all be involved in co-designing culturally engaging and context-appropriate risk communication and public outreach methods using a bottom-up strategy (49). The following model can be an example of the intervention and participation of different social groups in preventing or reducing the spread of false news or misinformation about the COVID-19 vaccination (Figure 2).
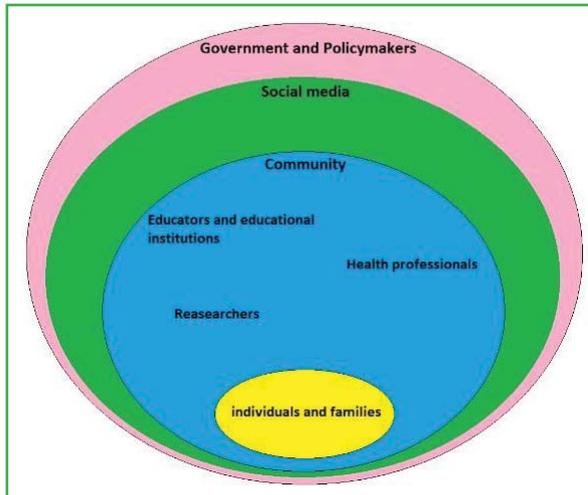
Figure 2: Participation of different social groups in preventing the COVID-19 vaccination misinformation.

In the following, the results of the literature review regarding the measures that can be taken to reduce misinformations at different levels are stated and discussed (Table I).

It is critical to engage with the community and the general public in order to raise vaccination campaign understanding (37). At the individual and family levels, people should encourage their families to improve their media literacy. In such a way, they read the news completely and paid to attention to its source(50). If they think the news is wrong, they should not forward it (48). Educators have a heavier role to play in confronting misinformation. In such a way, any organization or educational institute, such as schools, directly teaches their students to increase media literacy(48). They can also share their information with others through the media (51).

Health care providers are also among the key sectors in countering misinformation about COVID-19 vaccination. They are a role model for the community and their advice is trusted by most people (48). Therefore, in addition to providing accurate and scientific evidence-based information, they must monitor and critique media news (35, 52). Physicians, nurses,

midwives, and other professionals are well-respected and effective at debunking health misinformation. They can engage patients and the general public on health myths proactively. They must spend time learning about each patient's background, attitudes, and goals. When feasible, listen with compassion and correct misinformation in a personal manner. Try using less scientific terminology that is understandable to all individuals when discussing health issues. Frequently, look for ways to enhance people's health literacy (48). Medical workers can use communications technology to disseminate accurate health information to the general audience. Professional organizations, for example, can train their members to contribute as technical experts to the media and to disseminate peer-reviewed studies and expert viewpoints successfully online (50).

eHealth literacy is essential for surfing the internet in search of health information as well as processing information obtained through social media (36). Social media is proving to be a two-edged sword at COVID-19. Experts with the ability to weed out falsehoods should moderate social media accounts (37).

To increase communication and community participation, online platforms and media channels, such as radio, television, and cable channels, should be focused on correct information (53). They must also collaborate with community organizations and other local organizations to address health misinformation. Medical centers, for example, can collaborate with local people to create tailored public health messages. Associations and other medical institutions should provide physicians with training on how to deal with disinformation in ways that take into consideration the needs, worries, backgrounds, and perspectives of patients (48). Social media networks that want

to reduce the transmission of misinformation on their networks should constantly monitor and design new algorithms to detect vaccination misinformation, as well as adopt and apply restrictions on misinformation-containing content and advertising on their platforms (54, 55). Researchers can be of great help in creating scientific resources and conducting rigorous research on COVID-19 vaccines and making them available to the public in simple language (26, 41). Some technological networks have enhanced their efforts to control and combat misinformation by minimizing the spread of incorrect or misleading content and referring users to health information from reliable sources (48). It is necessary to find ways to keep (research) journalism cost-effective to provide high-quality content. It is critical to make a real, positive effort to teach, educate, and develop data journalists (50). It is more beneficial to explain why disinformation is erroneous rather than simply label it as false (50). Customize scientific knowledge to the specific needs of the target audience (50).

The control and monitoring of the mass media, which is one of the most important sources of misinformation, must be considered by all sections of society. Finally, the oversight and executive role of the government and policymakers in investing is crucial to conducting thorough research and coordinating the various departments to publish accurate and fact-based news. They can provide regional health departments with more funding and technical assistance to enable them to better handle questions, issues, and misinformation. Encourage the construction of teams within public health organizations that can discover local patterns of misinformation and educate public health misinformation and infodemic researchers, for example. To meet current needs, collaborate with local and national health officials and organizations (48). The actions to be taken to combat misinformation about the COVID-19 vaccination are shown in Table1.

Table 1. The key actions to be taken to combat misinformation about COVID-19 vaccination

Levels	Actions
Individuals and families	People should encourage their families to read the information completely before sharing it. Online misinformation is more likely to mislead older generations particularly than younger ones(50). Before posting or sharing something on social media, we can double-check that the information is correct and that the source is reliable. We can decide not to share if we are unsure (48). People should double-check their information with their relatives and friends (29). People react better to various sources of information outside of their media bubble, which enhances the likelihood that they will appropriately assess the legitimacy of information, rather than being informed explicitly that they are wrong (50). Try different ways to connect: listen with empathy, look for things you have in common, ask questions, offer different explanations and sources of information, stay calm, and don't expect to be successful in just one session (48). Citizens have little confidence in media news and information, but they are reasonably competent and confident in identifying fake news from actual news (35).

Educators and Educational Institutions	Media, science, digital, data, and health promotion programs should be used at all levels of education, including primary, secondary, post-secondary, and community-based settings (48).
	To facilitate personal relationships and upbeat discussions at the local and regional level (41).
	Partnering with public institutions, such as colleges, libraries, and schools, is also strongly suggested, since they represent a vital channel for communicating evidence-based knowledge to the wider public (52).
	Students and the general public should be educated on the strategies utilized by people who promote disinformation online. People's inclination to distribute false information can be reduced by teaching them how to identify these approaches. For example, presenting people who are not qualified as experts (49).
	Short online programs and learning materials can help people learn more about the media and health (51).
Health professionals	Professional material must be evidence-based and supported by scientific evidence (35).
	Expert groups should keep working with a skilled public relations firm to find and even predict possible fake news about COVID-19 vaccines and respond as soon as possible through all channels, including public and social media (52).
	It is also suggested to respond carefully to all fake news about the COVID-19 vaccines in a separate document in which they are explained and countered with scientific data, but in simple language so that anyone can understand them (37, 52).
	The physician is prohibited from engaging in any activity that includes the manipulation or concealment of information (35, 50).
	Health professionals, scientists, and academics should no longer be allowed to make false statements concerning COVID-19 vaccines. Medical councils, universities, and research institutes must regard them as unethical and handle them as such on a legal basis (52).
	Professional team to work with fact-checking organizations and local media to supply them with knowledge on how to combat the spread of fake news. Health professionals can clarify misinformation on social media by employing language that appeals to those who are undecided about immunizations (52).
	Medical students and residents need to take part in these efforts to raise awareness and fight infodemics and misinformation, since they know more about how to use social media than older medical professionals (37).
	All vaccinated scientists, medical professionals, and VIPs could be urged to discuss their decision-making process and any vaccine-related experiences (52).
	Providers can explain the importance, safety, and efficacy of vaccines to their clients. They can also advise their clients that there is a great deal of vaccine misinformation on the internet and point them to resources that can provide reliable information in plain English (54).
	Expert activities must step forward and use online, social, and traditional media to provide accurate, yet understandable information to non-specialists about the mechanism of vaccine action, the research process, approval regulations, and individual and public benefits of COVID-19 vaccinations, as well as their safety profile (52).
	Health professionals must warn clients about the harmful effects of fake news and also provide links to tools that can help them spot fake news (38).

Researchers	Do research to find out where false information comes from and what challenges and reasons there are for adopting data (50). Accelerate research on how health misinformation spreads and grows, as well as how and why it affects people, who is most exposed, and which approaches are most useful in combating it (48). Improve the tracking of health-related questions, issues, and disinformation. Concentrate on a greater range of materials and channels, as well as cross-platform sharing of information. Examine graphic and video-based data, as well as content in several languages. Improve data collection strategies to solve previous research limitations (48). Researchers can use questionnaires to guide their studies and uncover the requirements of diverse audiences/communities by building on existing partnerships with the public and patient groups (50). Examine the consequences of health misinformation. The need to accurately measure the effects of health misinformation is critical (48) Make it a priority to find out how people are exposed to and influenced by disinformation, and how this varies by subgroups of the population. Individualize approaches to meet the requirements of specific groups. Invite members of the community to help develop the study (48). Researchers can make computer programs that can find false information on the internet, respond to it (54).
Social media professionals and media organizations	Training local professional news sources in best practices for social media content management is another way to combat disinformation (50). Speak in your audience's language. Keep it simple and interesting. Rumors and ideas that spread quickly are frequently quite simple. People are more likely to share messages that are interesting and use words or pictures in a clever way (50). To make sure that all news organizations have access to high-quality learning, media companies should build their own training programs and work with journalism schools, charities, tech platforms, and other groups (48). Encourage real professionals to interact with the audience regularly using their chosen platforms (50). To build community-led social media groups to share data, evaluate, and counteract rumors among at-risk populations (50). On social media, warning flags that point out false information may make it seem less credible and make people less likely to share it. (42, 51). Vaccination messages must explain why immunization is necessary for a variety of individuals with a variety of problems, provide clear information, and set realistic expectations (50). Think of headlines and pictures that educate rather than shock or provoke. Headlines are generally the first thing that people notice and remember. If a headline is meant to disprove a rumor, it should start with the facts instead of just repeating the details of the rumor (48). Accounts spreading incorrect and bad information regarding the COVID-19 vaccine should be reported, and social media companies should be formally requested to warn or block them (37).

Social media professionals and media organizations	Those in charge of online social media should bear some responsibility, ensuring that content about the COVID-19 vaccinations is correct and preventing algorithms from promoting scientifically unsubstantiated assertions (52). Health advertising needs to be realistic, sensible, and honest so that it doesn't make people have the wrong ideas or give them the wrong expectations. (35). Professional public relations firms must continually spot and even anticipate any fake news about COVID-19 vaccines and reply as quickly as possible across all accessible platforms, including public and social media (52). Media professionals and journalists should always be coutious of unidentified sources to refining fairness in reporting news (40).
Government	Traditional and religious community leaders can advocate immunization by sharing helpful information, such as places and times of vaccination sessions, during community declarations and after religious services (29). Make data available to researchers so they can figure out how disinformation spreads and what effects it has (48). Compliance could be enforced with vaccine requirements in specific circumstances, such as for particular positions in the public sector with regular public contact (e.g., public employees, healthcare professionals, police, food handlers, etc.), or as a partial requirement for admittance to other work or travel (35). Related government organizations to donate to pushing messages around the safety of the vaccine (39). Rules and guidelines should be widely established, setting both standards for journalists and rules providing complaint processes for false or inappropriate reporting (50). Invest in calculating the cost of disinformation and creating evidence-based solutions. Concentrate on areas where private and public financing are in short supply, including independent and local journalism, platform monitoring, and community-based medical literacy programs (48). It is possible to avoid fragmentation and duplication of work by encouraging collaboration among fact-checking groups across the region and country (50). Increase the amount of money allocated to misinformation studies (48). Modernize public health messages as much as possible. Put out simple, reliable health information in a timely and responsible way, both online and off (48). Donors from the public and private sector should take part in behavioral and social research to figure out why vaccinations are being politicized and how to stop it (46). Invest more in long-term sensitivity to misinformation (48). Encourage the timely provision of correct information to all populations, particularly high-risk groups, based on scientific evidence (48, 52). Give detailed instructions for making a national strategic plan to stop false information about vaccines (48).

Discussions

After the WHO declaration of COVID-19 as a pandemic and a public health emergency (56), the unrestricted exchange of information on the web resulted in the saturation of social media with various verified and unverified information about the virus (12). Substantial dependence between the socio-behavioral aspect of the pandemic and individual and public health makes the infodemic a significant threat, but also a chance to influence attitudes and conduct in contemporary communities (57).

Besides its effect on COVID-19 vaccination intent, the spread of fake news prevents effective care and might threaten lives (58). These issues in vaccine uptake, together with declining community acceptance of other public health interventions, will mean a delayed recovery and a prolonged pandemic (59). While vaccine hesitancy has been declared a threat to global public health, the concept of public health vaccination programs should extend beyond the mere delivery of the vaccine to tackle the socio-environmental factors that increase COVD-19 vaccine confidence(60). According to the initial reports, the main COVID-19 vaccination worries were related to vaccine safety, vaccine speed, vaccine constituents, vaccine harmful impacts, financial and political targets, and limited perceived risk (61, 62). The conditions that evolved following the breakout of COVID-19, with lockdown restrictions and additional time for the manufacture, dissemination, and reading of all kinds of news, have been the ideal breeding ground for denialist viewpoints, conspiracy theories, and false news(35). According to the UNDP, COVID-19 guidance changes rapidly as medical knowledge advances, and this rapid evolution, along with the devastating impact on people's lives and livelihoods, has created a public desire for knowledge. Fear, stigmatization,

discrimination, and confusion have often resulted from the use of social media, informal news sources, and fringe journalism to fill the hole(63). The global healthcare community is confronted with the challenge of devising a variety of communication approaches for COVID-19 immunization initiatives that will appeal to a wide range of people and cultures (64). During epidemics, people require reliable information in order to alter their behavior and safeguard themselves, their family members, and their communities. Although an infodemic cannot be entirely removed, its effects can be controlled. Social media and the speed with which information spreads make it harder to handle an infodemic (57). Any comprehensive approach to misinformation management will necessitate, in addition to the creation of new measures, tight coordination with a number of ongoing activities. These may consist of constant monitoring of conventional and social networking sites; community feedback systems; risk communication and community engagement (RCCE) coordination mechanisms; crisis intervention procedures; vaccine preparation and delivery planning; and routine vaccination demand activities (28). Therefore, to avoid duplication of effort and to broaden the scope of participation, it may be necessary to collaborate with national, regional, and local entities, as well as international organizations and governments.

In addition, it is necessary to design and coordinate activities with partners to promote and ensure healthy living and well-being for individuals of all ages, as misinformation does not stop at national borders. The COVID-19 pandemic has shown how important it is to combine findings from different disciplines, make the field more coherent, and act as a catalyst for cross-sectoral and cross-disciplinary collaboration

(55). An infodemic management strategy has been issued by the WHO in an effort to offset the negative effects of COVID-19 on healthy behavior and preventive actions. Assuring an accurate detection system of the information flow, notably misinformation and disinformation dynamics inside communities by health sector institutions, is one of the five major policy areas enforced by the framework (57).

The WHO has formed myth-busting teams to work with media outlets like Facebook, Twitter, and YouTube to remove erroneous information about COVID-19 (65). .Furthermore, because health practitioners are a high-risk group for COVID-19, they serve as role models for the general population (52). Only real scientific information must be disseminated through appropriate means, with no ambiguity, hiding, or misinterpretation of criticism of other experts or their research and results (35). Regional organizations and societies, according to Ishiwatari et al, can play a critical role in disaster management, such as the COVID-19 outbreak, but they must be supported by essential scientific knowledge and information about disaster risk. As a result, a country's government and international institutions such as WHO, and UNICEF can establish science education centers for community agencies, government spokespeople such as the minister of health or others, and community leaders individually and collectively (66). The world, however, was unprepared for this catastrophic calamity because of minimal global cooperation in the early phases (67).

Generally, actions to tackle the spread of vaccine misinformation include the moderation of content on social media platforms; ensuring the public has access to accurate and reliable information; and providing education and guidance to people on how to address vaccine misinformation. Health policymakers must realize

the most important concerns of people about the COVID-19 vaccine. Concerns that do not necessarily lead to vaccine rejection are also significant because enhancing public confidence in the vaccine and encouraging individuals to get vaccinated will eventually disrupt the COVID-19 epidemic's transmission chain and put an end to it. Media organizations also need to devote more resources to identifying and correcting misinformation about COVID-19. Platforms with large numbers of users must improve their attempts to combat misconceptions by minimizing the spread of inaccurate or misleading content and guiding users to credible sources of health information. Researchers and health care providers can also do their part to fight misinformation by using trusted and appealing ways to spread accurate information. This research gave an overview of actions to promote vaccination of COVID-19. One limitation of this study was the lack of a quality assessment of the publications. Within the scope of this study, we looked at documents and articles published in English that may have missed crucial evidence reported in other languages. The specific activities taken at various levels assist people, researchers, healthcare providers, the media, and the government in taking effective steps to eliminate misleading information, allowing more people to get vaccinated, and maintaining public health. This will necessitate a multi-sectorial approach involving political, technical, and operational commitments from the government at all levels. It is suggested that qualitative studies be done with policymakers, health managers, and health care professionals to find out what challenges make it hard to adopt the necessary actions for infodemic management and fake news control for COVID-19 vaccination.

Conclusion: The spread of false information about COVID-19 poses a serious risk to not

only the success of vaccination campaigns but to public health in general. Tackling misinformation spread requires more than just the tech giants, and everyone has a role to play, from policy-makers to community leaders and individuals. Therefore, the most effective approach to overcoming health misinformation is to recognize that everyone at all levels of society, from micro to macro, must recognize that this is their moral and civic responsibility and that they must hold themselves accountable.

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