

Access this article online
Quick Response Code:

Website: www.jehp.net
DOI: 10.4103/jehp.jehp_1271_20

Information challenges of COVID-19: A qualitative research

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Abstract:

BACKGROUND: At the beginning of the COVID-19 pandemic, the Iranian Ministry of Health and Medical Education set up a 24-h call center, i.e., Center 4030, to mitigate people's worries and anxieties, create composure, increase people's trust, and answer their questions. This qualitative study aimed to identify the challenges of COVID-19-related-information among people in point of experts' views.

MATERIALS AND METHODS: This qualitative study was conducted to collect the opinions of experts on the identification of the Information challenges of COVID-19 during March–June 2020. The research population included all health professionals and experts. The sampling method was initially purposive and continued to saturate the data as snowball technique. In this study, 19 participants were interviewed. The data were collected using a semi-structured interview. After collecting the data, the audio files of the interviews were written down to extract their external and internal elements. MAXQDA version 12 software was used to organize qualitative analysis and coding data.

RESULTS: The results of this study involved eight themes, i.e., lack of planning, lack of social trust in government, lack of COVID-19-integrated scientific authority in the country, conflicts of interest, lack of integrated information sources, distracting public attention, infodemic, and poor information quality, classified into 16 categories.

CONCLUSIONS: The main information challenges that people in Iran faced included the lack of a scientific reference source to access accurate information, the existence of a large volume of information in virtual networks, and a huge volume of statistics from various information channels that caused confusion among people.

Keywords:

COVID-19, information challenges, qualitative research

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Received: 19-09-2020
Accepted: 29-11-2020
Published: 30-07-2021

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Introduction

In general, any outbreak will be accompanied by a tsunami of information, which, unfortunately, most often includes misinformation and rumors as well. Moreover, this is significantly intensified in the current century due to the availability and ubiquity of social media. Obviously, getting the right information from a reliable source is a key issue in this type of pandemics.^[1] "Access to the right information can save lives," argues Zaimova, quoting the head of the World Health Organization (WHO).^[2] In the recent COVID-19 pandemic, besides the

challenges exerted upon the health system, the rapid dissemination of information, including false and misleading information about the disease, has had a major impact on the behavioral patterns of people in various communities. Therefore, community leaders and governments must take appropriate measures to ensure that people have access to reliable and relevant information about COVID-19. The head of the Atlantic Consulate, Wedelmann, acknowledges that scientists and other experts are the most reliable source of information, and governments and employers should call on them to obtain the most reliable information.^[3] Evidence suggests that people unintentionally share false information

How to cite this article: Atighechian G, Rezaei F, Tavakoli N, Abarghoian M. Information challenges of COVID-19: A qualitative research. *J Edu Health Promot* 2021;10:279.

about COVID-19, without thinking about its authenticity, based on various motives such as entertainment and attracting attention and approval on social media. Lack of transparency also leads to rumors, speculation, and misinformation.^[4] Hua and Shaw stated that 44% of people were actively looking for reliable information, following the news, and putting their interests first, while 33% only passively digested information about COVID-19.^[1] In this regard, the dangers of misinformation during the management of COVID-19 outbreak have been introduced with the term “infodemic.” Some experts believe that infodemic, i.e., too much information including right as well as wrong information, is spreading around the world. The worst-case scenario involves the fact that incorrect information is potentially released faster than the virus itself, causing people to make uninformed or misinformed decisions.^[5] Therefore, there is the challenge of how people search for or avoid information. On the other hand, the unprecedented distribution of information on social media has provided people with access to a large amount of information. This has caused the spread of rumors and the dissemination of questionable information. As a result, this information conflict has led to the development of misinformation among people, as well as a negative impact on their behavior.^[3] In addition, the psychological effects of misinformation on social media are significant. Therefore, if people cannot verify the accuracy of a large portion of information in cyberspace and the media, they will be anxious and worried. Therefore, it is necessary to draw their attention to the information that is published by official institutions and government agencies.^[6] The WHO has said that misinformation has hampered the efforts of organizations and governments to control the spread of COVID-19. This makes it difficult to hear the voices of health-care organizations. Therefore, major attention and resources have been allocated to dealing with misinformation. Because the spread of this pandemic has been accompanied by a wide range of useless informational content, it has created new challenges.^[7] While expressing his concern about the publication of false information about COVID-19, the head of the WHO admits that we are not fighting the coronavirus; rather, we are fighting the infodemic. Since false news and misinformation during this time will lead to misguided medical advice worldwide, the question is how to deal with such a serious problem.^[8] In this regard, it is important for traditional and modern social media to help people have a better understanding of what they are looking for information about because these media are sometimes ahead of the evidence.^[9] With the increasing use of social media and communication technologies, the infodemic challenge is growing,^[10] and the sheer volume of online information is increasing people’s anxiety. Therefore, it is imperative for the digital media platforms to be environmentally friendly and to create

trust and calmness among people, especially when sharing information related to health and life threats.^[11] On the other hand, many reliable sources, such as the WHO, are on social media, which can reduce people’s anxiety by giving them access to the correct information while controlling the virus at the same time. Of course, the impact of the response to the infodemic varies depending on people’s trust in the authorities and officials from one country to the other.^[7] As the demand for access to reliable and timely information about COVID-19 increases in the community, policymakers need to be aware of the best practices for reducing the risk of the infodemic and turning to knowledge and expertise available in academic settings.^[12] The wrong information is one of the great human challenges in the new COVID-19 crisis. Some people spend a lot of time reading-related information in print and virtual media. However, they are unable to distinguish quality information from false and low-quality information. This information reinforces the challenges, and people need to be equipped with the knowledge and skills of health literacy and media health literacy.^[13] Academics and scientists need to pay attention to two basic aspects to share scientific information. These include filters that have the ability to increase the validity of data and the individual responsibility for creating and distributing information among people.^[14] Information from all sources should be transferred to a dedicated COVID-19 center to discover, diagnose, treat, and most importantly, inform policymakers, investors, resource providers, affected populations, and social media. Reproduction and enhancement of misinformation must be prevented. In all scenarios, information must be at the level of understanding of the relevant community.^[15] Over the past 2 months in Iran, people have faced many challenges due to concerns about the spread of COVID-19 because of the spread of large amounts of scattered and disorganized information on social media from domestic and foreign sources. This has exacerbated their concerns and confusion about conscious decisions on this disease’s prevention and care. On the other hand, the repeated recommendations of the media and the retelling of the decisions and actions of the officials, which were sometimes inconsistent and contradictory, led to the intensification of mental fatigue and confusion of the families.^[16] At the beginning of this pandemic, the Iranian Ministry of Health and Medical Education set up a 24-h call center, i.e., Center 4030, to mitigate people’s worries and anxieties, create composure, increase people’s trust, and answer their questions. The main objective of this call center has been to answer ambiguities and prevent rumors.

However, despite the implementation of this important step, people are still resorting to various sources to obtain information in the face of numerous information challenges related to the coronavirus, and

this qualitative study has been designed to identify them.

Materials and Methods

Study Design and Setting: In this study, a qualitative study was conducted to collect the opinions of experts on the identification of the information characteristics and challenges of COVID-19 during March–June 2020.

Study participants and sampling: The research population included all health professionals and experts, including university faculty members, policymakers, university administrators and experts and physicians, nurses working in the infectious diseases unit. The sampling method was initially purposive and continued to saturate the data as snowball technique. First, five participants were selected who had experience or knowledge about the main phenomenon or basic concepts explored. In this regard, to access different opinions about the central phenomenon and the explored concepts, the sampling with maximum diversity was performed, and people with different views were selected. Sampling continued until data saturation. In this study, 19 participants were interviewed. Inclusion criteria consisted of all professionals, policymakers, managers, and experts with at least 5 years of experience. Furthermore, individuals who refused to be interviewed were excluded.

Data Collection Tool and Technique: The data were collected using a semi-structured interview. To verify the validity of the interview guide, the interview questions among the research team were first discussed with the participation of one external expert and revised accordingly. The interview guide was subsequently tested on three nonparticipants to check the number and order of the questions in the study. It is achieved by analyzing and comparing the contents of the interview until no new or appropriate details concerning a theme appear to emerge.

The time and place of the interview were prearranged with the participants, preceded by obtaining their permission through an informed consent form. The interviews were recorded through a voice recorder. Due to the prevalence of corona, some interviews were conducted by phone. After collecting the data, the audio files of the interviews were written down to extract their external and internal elements.

MAXQDA Plus version 12 software (Release 12.3.0, VERBI GmbH Berlin) was used to organize qualitative analysis

and coding data. For the evaluation of the reliability of the study data, four criteria were used in Lincoln and Goba, namely, credibility, conformability, dependability, and transferability (Lincoln YS and Guba EG, 1985).

Ethical consideration: This study received the required ethics approval from Isfahan University of Medical Sciences Research Ethics Committee, Isfahan, Iran, with ethics code No. IR.MUI.MED.REC.1398.653.

Results

More than half of the participants were male (63.1%), and the majority had a PhD (42.1%). Furthermore, more than half of the participants (52.6%) had more than 20 years of experience [Table 1].

The results of this study involved eight themes, i.e., lack of planning, lack of social trust in government, lack of COVID-19-integrated scientific authority in the country, conflicts of interest, lack of integrated information sources, distracting public attention, infodemic, and poor information quality [Table 2], classified into 16 categories.

Lack of planning

Lack of planning involves invalid information and a lack of consistency in informing the public.

Participants believed that invalid information and instability in information-related decisions were indicative of the authorities' lack of planning in the COVID-19 outbreak. The confusion of health policymakers in the decision-making process, the government's different decisions to declare closures for different jobs, and the variable decisions of managers were among the issues that the participants referred to.

The Ministry of Health and Medical Education and the health authorities do not have specific credible channels and entries, so weaknesses and conflicts are transferred to the community, then their authority is destroyed, and people lose confidence in official sources (Interviewee 5).

The reasons for the officials' lack of planning in this pandemic involved managers' changing decisions, people's confusion about whether COVID-19 was getting serious or not, lack of foresight and preparedness of the government to guide people, failure to implement preventive measures to mitigate the confusion of people, and politically ignoring the support and experience of other countries.

Table 1: Basic characteristics of participants

Variable	Gender, n (%)		Work experience (years), n (%)			Level of education, n (%)				
	Male	Female	<10 years	10-20 years	>20 years	B.S	M.S	M.D	Ph.D	Specialist
Participants	12 (63.1)	7 (36.8)	4 (21.1)	5 (26.3)	10 (52.6)	1 (5.3)	4 (21.1)	2 (10.5)	8 (42.1)	4 (21.1)

Table 2: Information challenges regarding COVID-19

Themes	Categories	Codes	
Lack of planning	invalid informing	Giving hopeless promise to people	
		Some recommendations are not applicable, such as the use of masks and gloves if these items are not found	
		Failure to adapt the methods and recommendations provided to the culture of the community	
		Health issues affected by politics	
		Confusion of health policymakers in decisions	
	Lack of consistency for informing public	Lack of foresight and government readiness to guide the people and take precautionary measures	
		Lack of follow the health issues by authorities	
		Ignoring the support and experience of other countries politically	
		Different government decision to declare closure in different jobs	
		Managers' changing decisions and people's confusion getting serious the Covid-19 or not	
Lack of social trust	Lack of authorities ' transparency to informing people	People distrust due to the release of private meeting's content	
		People's attention and trust in unofficial channels	
		Informing in an environment without trust, justice, fairness, and participation	
		Managers' inability to encourage cooperation and public trust	
		Lack of timely notification	
		Maintain secret the number of deaths and infections	
		Lack of real and objective information about the epidemic	
		Lack of clear information in the early days of the epidemic	
		The statistics are not clear to the public	
		Lack of public trust to government	Lack of public trust to government
No attention seriously to the crisis in early days and not announcing it by the national media			
More trust in social media instead of country's official media			
Lack of public confidence in official sources of information			
Lack of trust to health-care organizations			
Lack of trust in health-care staff due to lack of facilities			
Imagination of disrespect and worthlessness by government			
Numerous translations of Lancet articles by different academics			
Parallel work in the translation of scientific sources			
Claims based on a scientific article or single report			
Lack of COVID-19 integrated scientific authority in country	Lack of consistency of published information	Lack of accurate and proven information in articles and journals	
		Lack of information needs assessment	
		The information that is given to people is not practical	
		Publication of specialized information from nonspecialized sources	
		Lack of practical training at the beginning of the disease	
	Various media and informing sources	Various media and informing sources	Lack of consensus among experts on some scientific topics
			Confusion of people with different articles
			Information confusion due to the comparison of multiple information sources
			Several guidelines from different universities
			Long guidelines
Conflicts of Interests	Lack of authorities' consensus	Priority of government interests over national interests	
		Lack of taking responsibility by officials	
		Lack of common sense among officials	
		Conflicts in policymaking	
		Weakening of managers' performance by each other in relation to disease control	
	Ignoring the different Specialized opinion of experts	Ignoring the different Specialized opinion of experts	Comments of non-experts but significant in society
			Noncompliance with professional privacy
			Each specialist in each field has a speech tribune
			The multiplicity of nontechnical spokespersons in the national media

Contd...

Table 2: Contd...

Themes	Categories	Codes	
Lack of integrated information sources	parallel notification of media	Existence of multiple telephone lines	
		Existence of cyberspace and more correct information needs of people	
		Lack of unique information source	
		Lack of reliable and trustworthy resources to use people	
		Existence of multiple, nonspecialized, and nontechnical sources of information	
		Create multiple sites by different institutions	
		Create multiple websites by different institutions	
	lack of valid informing channels	Issuing content from different sources and being polyphonic	
		Getting information from invalid sources and creating anxiety	
		Lack of a reputable reference website to answer all questions	
		Contradiction of official media news with social networks	
		Information from multiple and contradictory channels	
		Lack of knowledge about where to go for information	
		Inability of people to validate information	
Distracting public attention	None	Parallel work in informing	
		Lack of information authority	
		Stimulating people through cyberspace	
		Speculation due to the pursuit of cyberspace	
		Easy access to unreliable resources and virtual networks	
		Misuse of profiteers through virtual networks	
		Each person has a tribune in cyberspace	
		There are many malicious networks abroad	
		Public concern by foreign satellites	
		The gap between the government's reported data and foreign media about the disease	
Infodemic	widely dissemination of information	Existence of multiple information resources	
		High volume of available information	
		Anarchy of information and creating anxiety and stress among people	
Poor information quality	Diffusion of false information	Information bombardment	
		Dissemination of false news on virtual networks	
	Disinformation	Lack of refining and information purification	
		Information with political bias	
		Information with guild bias	
	Contradictory information	Contradictory information	Hiding the government and not telling the facts
			Contradictory information
			Contradictory statements of officials
			Different news
	Limit access to information	Limit access to information	Information focusing on a specific field
			Lack of access to accurate and comprehensive information about this disease
	Misinformation	Misinformation	Inaccessibility of accurate statistics on the number of infected people and creating anxiety in people
			Spreading rumors
There is a lot of false news in cyberspace			
Existence of profiteers and making fake news			
Rumors spread by virtual networks			
Incorrect notification through satellite			
Multiplicity of invalid sources			
Incomplete and incorrect information about the disease			
Wrong comparison of this disease with cold and flu			
Improper media reassurances to protect the safety of a particular group such as children			
Exaggerate and less realistic considering the risks of the disease and the recommendations provided			

Due to the fact that the news and information about the Coronavirus unfortunately reached the people very late, the members of the community partially underestimated the epidemic, and no training was provided (Interviewee 1).

Lack of social trust in government

This involved lack of transparency from the officials in informing people, and a lack of trust on the part of people due to authorities downplaying the seriousness

of the crisis. The government's secrecy in providing information about the number of deaths and infections led to people shifting their attention and trust to unofficial channels, which was a sign of their lack of social trust.

People's attention and trust in unofficial channels was expressed as one of the signs of social distrust. People always think that the government is hiding the facts from the foreign channels or from other media, that is, we have a kind of unhealthy atmosphere (Interviewee 1).

Participants cited a lack of transparent information in the early days of the epidemic and lack of timely information as some of the reasons for people's distrust.

The more realistic and transparent we talk to people, the more we can gain people's trust. People traditionally trust centers that have long been among their safe havens. Well, naturally, medical centers are one of these centers (Interviewee 10).

The lack of transparency in the statistics was another reason for people's distrust.

For example, even in the case of statistics, it is not yet clear whether the statistics are real or not. Even if they weren't real, it would definitely be a good reason behind it that I don't want to talk about. There is probably a reason, and I have to admit, they don't want to announce the actual statistics (Interviewee 2).

Lack of COVID-19-integrated scientific authority in the country

This theme includes a lack of consistency of published information and various media and informational sources. The lack of an integrated scientific reference led to parallel work, lack of consensus among experts on some scientific topics, and information confusion when comparing multiple information sources.

Recently, The Islamic Republic of Iran Medical Council has been working for itself, which is, in my opinion, wrong. All of this must be centralized, and in fact we must have a position of information management under the supervision of the Ministry of Health and Medical Education. All material produced must first be approved by the Ministry of Health and Medical Education, and then reach the public (Interviewee 17).

Conflicts of interest

This included disagreement between officials and disregard for different specialties. Lack of consensus among authorities and ignoring the different specialized opinion of experts led to conflicts of interest.

Every organization considers its own interests and does not value us (the Ministry of Health and Medical Education). They

do not follow government orders, even if it is to their detriment. Therefore, providing information under these conditions will not be effective (Interviewee 1).

The multiplicity of nontechnical spokespersons in the national media and noncompliance with professional privacy were some of the issues raised by the participants.

Well, I don't know what's behind the scene. But when we hear and compare their official statements, there are all kinds of conflicts in the policies and words of health policymakers (Interviewee 5).

Lack of integrated information sources

This category included parallel information provision streams from the media and a lack of valid information provision channels. The existence of multiple telephone lines multiple websites created by different individuals indicated a lack of an integrated information source in the country.

One organization said we would give people a phone number, another said we would create a website. However, everyone wants to have an information channel (Interviewee 2).

Lack of knowledge about where to go for information and parallel work in informing indicated the lack of an integrated information source in the country.

People don't know where to get information and which information source to trust. Well, the existence of social networks makes information available to the public, but the important thing is to trust our own mass media or a foreign media (Interviewee 11).

Distracting public attention

This category included provoking people through cyberspace, speculations caused by following the cyberspace information sources, easy access to unreliable sources and virtual networks, misuse of virtual networks by profiteers, each person having a tribune in the cyberspace, and increasing public concern by foreign channels.

I spend almost 90% of my time dealing with and denying false news. Sir, this is not true, sir, this is not true, sir, this is not true, and then the one I can say is right is what the Ministry said. So it is better, at least for ourselves, to have the unity of voice as always (Interviewee 3).

The gap between the data reported by the government and that reported by foreign media on the disease has raised concerns.

If people are given regular statistics, their fears will be reduced (Interviewee 3).

Infodemic

This category included a wide dissemination of information and diffusion of false information. From the participants' point of view, the high volume of available information and the anarchy of information in COVID-19 caused anxiety and confusion among people.

The most important problem, in my opinion, is that people are confused about information, that is, they have become so bombarded with information that they can't really decide what to do (Interviewee 10).

The availability of multiple sources of information, the dissemination of false news on virtual networks, and lack of information refining have prevented people from distinguishing between right and wrong information.

Valid and reliable information must be given to people. People receive general information about COVID-19 from various media outlets, but they do not have the same information about necessary actions, such as disinfecting surfaces. One source says make Javelle water and bleaching solution with a ratio of 1:4. Another source says make it with a ratio of 1:49, another says make it with the ratio of 1:100. Individuals and/or organizations give different instructions (Interviewee 17).

Poor information quality

This category included disinformation, contradictory information, limited access to information, and misinformation. Lack of access to accurate and comprehensive information about the disease and the lack of accurate statistics on the number of infected individuals have caused concern.

We do not have accurate statistics. We don't know how many patients we have, how many samples have been sent, how many have been positive and how many have been negative. This causes fear and panic among people (Interviewee 14).

Participants acknowledged that the spread of rumors and false news by virtual networks has accelerated the dissemination of low-quality and misleading information.

At present, the media and social networks in the country have spread false information among people by spreading rumors in the community. Of course, there are reasons why we may have caused this (Interviewee 7).

Discussion

Appropriate behavioral patterns among authorities and the public in epidemics regarding the production and distribution of information in various media are very helpful in promoting public awareness and

knowledge for the prevention of epidemics.^[17] In the present study, participants believed that provided medical information should be organized, simple, and fluent and in a language that is easy to understand by ordinary people to reduce concerns and anxieties of people. As many behavioral fears and reactions naturally arise from a lack of knowledge, rumors, and misinformation, providing clear, concise, and accurate information about COVID-19, and user-friendly ways to access such information reduce the public's focus on rumors.^[18] According to the participants' views, multiple instructions from different universities, the presence of multiple articles and longwinded instructions, and the presence of multiple sources of information that must be compared have led to confusion. Moreover, they emphasized that people must refer to reliable information sources such as the website of the Ministry of Health and Medical Education, doctors' inquiries, the National Broadcasting Media, and trustworthy online news, to reduce their worries about the virus and to prevent being infected with misinformation. The WHO states that insufficient information about the coronavirus increases the likelihood of mistrust in government and authorities. In addition, this organization recommends searching for information from reliable sources, such as radio and television, and national newspapers, once or twice a day instead of once every hour, helping people manage and reduce their stress.^[19] As worst-case scenarios are usually accelerated when there is no information, leaders should provide the most up-to-date information about COVID-19 for health workers to know how to protect themselves and what to do if they encounter it. In addition, the leaders should anticipate what questions might arise and prepare their answers well. In this way, they are empowered with reliable information so that they can help themselves and control their stress.^[20] In their study, Stirling *et al.* found that 66.4% and 55.3% of medical students depended on the internet, and television and radio for getting coronavirus information, respectively.^[21] Participants in the present study acknowledged that a lack of clear information and normalizing the prevalence and risk of the disease by the radio and television channels at the beginning of the epidemic, lack of transparency in the statistics provided to the public, provision of politically biased information, government secrecy and untruths, rumors, and dissemination of various pieces of false news in virtual media led to people's concern and confusion in obtaining accurate and reliable information. The findings of the present study were consistent with Baines study, showing that a lack of transparency and delay in public urgency led to fears among the health authorities and delays in disclosing information about COVID-19, spreading misinformation and rumors among the public, incorrect public forecasting, ultimately causing the unexpected dissemination of the virus.^[22] Moreover, the findings of

the present study were in line with those of Dong's study, showing that downplaying the severity of the epidemic of COVID-19 by the Chinese government in the early days caused people's distrust in the transparency and the decision-making capability of the government.^[23] In the present study, according to the participants' views, the infodemic phenomenon led to people's confusion. In this regard, the presence of numerous information sources, the high volume of available information, people's anxiety caused by information anarchy, information redundancy, lack of information refining and cleaning instruments, and the misrepresentation of news in virtual networks were mentioned as examples. Lu's study showed that infodemic, including incorrect information about COVID-19 on social media and elsewhere, caused a major risk to people's mental health during this crisis.^[23] In his study, Bains emphasized that, in order to fight infodemic, it was necessary to analyze all types of information, to have an integrated scientific approach, to have a clear and scientific definition of all types of information, and to avoid using wrong words.^[22] The findings of the current study showed that provoking people through virtual networks, speculation due to following cyberspace channels, easy access to unreliable sources in virtual networks, and the misuse of virtual networks by profiteers were significant challenges people encountered. Allah Verdi believes that there is a difference between producing and disseminating COVID-19 health messages and disseminated unprofessional messages on social media. Hence, in order to break the chain of disease transmission, it is necessary for the health system to take measures to prevent the spread of misinformation.^[24] Kouzy *et al.* analyzed 673 tweets and showed that the least amount of unconfirmed information was related to public health accounts and accounts of health-care services, while the most misleading information was related to personal and group accounts. Another noteworthy point in her study was the lower incidence of misinformation when searching the literature using COVID-19 instead of 2019_nCoV and corona. She believes that incorrect medical information and a lot of unconfirmed content about COVID-19 are being widely published on social media, and it is necessary to intervene in this process to protect public safety.^[25] The other challenges mentioned in the present study involved promoting people's awareness in an unfair environment structured around mistrust, higher levels of trust on the part of people in social media than mass media, people's distrust of official information sources, failure to take the virus seriously, failure to inform people by the national media, lack of managers' ability to attract public cooperation and trust, failure to provide timely information, and secrecy in reporting the number of COVID-19 deaths and patients. In her study, Sharma emphasized that the health-care organizations and other authorities should develop practical strategies

for identifying credible and reliable information sources and disseminating valid information about COVID-19. In addition, she argues that, using scientific methods, such as data mining, for identifying and removing those messages in virtual networks which have no scientific evidence behind them is one of the legal measures that can be taken.^[26,27] In the current study, provision of contradicting content from different sources; obtaining information from invalid sources, which creates anxiety; lack of a reputable reference source to answer all relevant questions; contradiction between official media news and social networks; availability of information from multiple and contradictory channels; and lack of knowledge on where to go for reliable information were among other challenges noted by the participants. Hua described the reasons of China's success in controlling COVID-19 as a strong government, implementing restrictions, and people's immediate participation. In the early stages, the highest judicial authority's guidelines on false news constituted an important step toward reducing confusion and panic among people.^[12] In Medford's study, about half of the tweets scared people and about 30% were surprising them, among which the political and economic impacts of COVID-19 were the most important discussion topics.^[28]

Shankar pointed out that one of the challenges for medical staff in dealing with cancer patients, who wanted to find accurate information to adapt to the conditions of COVID-19, was the existence of a large volume of information on virtual networks.^[29] Health ministries and health education specialists in various countries should design an interactive dashboard to deal with the release of huge amounts of inaccurate information and misinformation, provide real-time information, and eliminate rumors related to COVID-19 around the world.^[24] In his study, Bastani emphasized that health department's managers should have practical perspectives on managing public information in the community.^[30]

Conclusions

With the COVID-19 pandemic, information seeking, especially on social media, emerged as one of the major challenges facing the affected communities. In this regard, the large volume of information and the lack of a reliable source to obtain accurate information, especially in the early days, caused concern and anxiety among people. In this study, the main information challenges that people in Iran faced included the lack of a scientific reference source to access accurate information, the existence of a large volume of information in virtual networks, and a huge volume of statistics and detailed news from various information channels that caused confusion among people. Therefore, considering the

fact that epidemiological predictions show the high likelihood for the continuation or re-spread of this virus, it is recommended that health leaders identify and/or introduce a scientific authority for information related to COVID-19 in the country; introduce reliable information sources; provide simple, legible, and transparent information; and encourage people to improve their knowledge so that they can correctly interpret the right information, and keep themselves and their families safe from the virus.

Acknowledgments

We would like to thank all interviewees for their kind contribution. Moreover, the authors cordially appreciate Dr. Hasan Ashrafi-Rizi for his kind help and guidance.

Financial support and sponsorship

This study was funded by Isfahan University of Medical Sciences, Isfahan, Iran, with research code No. 198222.

Conflicts of interest

There are no conflicts of interest.

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