Managing Infodemic on COVID-19 Related Issues: 'Building Resilience to Misinformation' in IRNA and FARS News Agencies Instagram Pages

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Abstract

The present article aims to investigate the modality of coverage and infodemic management regarding COVID 19 by the two Iranian mainstream media i.e., IRNA and Fars News Agency. To investigate the modality of infodemic management, the article specifically examines 'building resilience to misinformation'. To reach this aim, content analysis has been used. Data for this study were selected from the Instagram pages of Fars News Agency (@fras_news) and Islamic Republic News Agency (IRNA) (Irna_1313) from February 19, 2019, the day of the official announcement regarding the first Corona virus case in Iran, until October 25, 2021. In total 218 items were collected, out of which 64 cases were from IRNA and 154 were from Fars News Agency. Both news agencies were examined in terms of infodemic type, Infodemic themes and infodemic sources. The results of the study indicated that in terms of infodemic type, Fars mainly focused on fake news; while IRNA concentrated on prevalent public questions and concerns regarding the Corona virus. In terms of infodemic themes, both news agencies focused on Corona phobia and vaccination. The results of the study indicate that social networking sites are the main sources of spreading infodemic regarding COVID-19.

Keywords: COVID-19, Fake news, Infodemic management, Instagram, Mainstream media, Misinformation

1. Introduction

The Director-General of the World Health Organization (WHO), Tedros Adhanom Ghebreyesus finishes his speech at the gathering of foreign policy and security experts held in Germany on February 15, 2020, with the three following statements: "This is a time for facts, not fear, this is a time for rationality, not rumors and this is a time for solidarity, not stigma" (WHO, 2020). He particularly puts a special attention to the second statement by mentioning "we're not just fighting an epidemic; we're fighting an infodemic" (WHO, 2020). The term 'infodemic' which is a combination of information and epidemic has been defined by WHO (2021) as "too much information including false or misleading information in digital and physical environments during a disease outbreak". It has also been defined as "a contagious disease infecting our information culture" (Solomon, 2020, p. 1806). Infodemic is frequently associated with fake news, false claims and misinformation (Broniatowski, et al, 2021, p. 4). According to Cinelli, et al. (2020, p. 1) "The term *infodemic* has been coined to outline the perils of misinformation phenomena during the management of disease outbreaks, since it could even speed up the epidemic process by influencing and fragmenting social response". The concerns over infodemic have intensified with the rise of social media. Social media have provided a great opportunity for spreading fast and vast news and information during crisis. At the same time, they have the potential to spread fake news and false information. The consequences of infodemic can be serious. As maintained by WHO (2021), it causes confusion among citizens and makes them adopt risky behaviors that could harm their health. As an illustration, taking Alcohol as a cure for Coronavirus led to serious injuries and death of several Iranians at the early stages of spreading the disease (Karimi &

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Gambrell, 2020, in Patwa et al., 2020, p. 1). Other consequences include mistrusts to authorities which leads to reducing people's commitment to health advises (Broniatowski, et al., 2021, p. 4; WHO, 2021). In addition, "an infodemic can intensify or lengthen outbreaks when people are unsure about what they need to do to protect their health and the health of people around them" (WHO, 2021).

Infodemic is a global issue; almost all countries are, in some ways, dealing with the issue. Evidence widely shows that authorities and media have tried to tackle this issue. As an illustration, the government of India, in its official website, which has been allocated to information and education provision for the citizens regarding COVID 19, put two specific sections as MyGovMythBuster and MyGovFactCheck, in which explanations and responses to questions were constantly provided regarding false information and fake news, prevalent in different social media in India. Iran is not an exception in this regard. In parallel with the public announcement regarding the first identified Coronavirus case in Iran on February 19, 2020 by the Ministry of Health and Medicine Education (MOHME), a wave of misleading and fake news spread in different Iranian social media.

In such situation, infodemic management is crucial; Infodemic management is "the systematic use of risk- and evidence-based analysis and approaches to manage the infodemic and reduce its impact on health behaviors during health emergencies" (WHO, 2021). According to WHO (2021), infodemic management includes the following four activities: (1) listening to community concerns and questions; (2) promoting an understanding of the risk, as well as health experts' advice; (3) building resilience to misinformation; and, (4) engaging and empowering communities to take positive

action. In this process, tackling to spread misinformation is a significant factor, and as Patwa et al. (2020, p.1) maintain "the first step towards tackling the fake news is to identify it". Mainstream media can play an important role in introducing infodemic to the society; they can also play an important role in tackling misinformation. They can provide facts from reliable resources and offer them to the audiences, who are surrounded by different fake news and false information. The present study therefore aims to investigate the function of two Iranian mainstream media i.e Fars News Agency and Islamic Republic News Agency (IRNA) to manage infodemic that has spread in social media platforms in Iran from the first days of the disease outbreak in the country.

The article first reviews previous studies regarding infodemic management. It will then elaborate the details of the qualitative content analysis that has been employed as the main research method. The research findings and discussion will then be presented. Finally, the paper concludes with some remarks on the role of mainstream media in managing infodemic during the pandemic in Iran.

2. Literature Review

Reviewing previous studies on managing infodemic and in particular combating fake news regarding COVID 19 depicts two general categories in this regard:

1. Studies on infodemic management from the healthcare perspective (Scott, 2021; Tangcharoensathien, et al. 2020),

2. Studies on the role and engagement of media in the formation and management of infodemic (Cinelli, et al., 2020).

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Eysenbach (2020) in an article titled 'How to Fight an Infodemic: The four Pillars of Infodemic Management' proposes for major principles of infodemic management including "(1) information monitoring; (2) building e-Health literacy and science literacy capacity; (3) encouraging knowledge refinement and quality improvement processes; and (4) accurate and timely knowledge translation, minimizing distorting factors such as political or commercial influences" (p. 1). In another article titled 'COVID-19 Pandemic, infodemic and the role of eHealth literacy', Chong, et al. (2020) suggested improving eHealth literacy on COVID 19 as an important factor to reduce the challenges of infodemic. In a more practical sense, Mheidly & Fares (2020) proposed a particular health communication strategy called 'Infodemic Response Checklist' to overcome the COVID 19 infodemic.

The second group of studies have focused on the role of media and in particular social media in both the formation and the management of infodemic. Zhang, et al., (2021) investigated the COVID-19 infodemic on Chinese social media; they employed a content analysis on the posts related to the COVID-19 false information in the most important and influential social media platforms in China. They came to the conclusion that "the COVID-19 infodemic on Chinese social media was characterized by gradual progress, videoization, and repeated fluctuations". In addition, their study indicated that "the COVID-19 infodemic is paralleled to the propagation of the COVID-19 epidemic" (p. 1).

Characterizing COVID 19 misinformation has been at the core attention of other scholars in other countries. A very practical example of this type of study was conducted by Al-Zaman (2021) on the characterization of the COVID-19-related social media fake

news in India. He investigated five issues vis-à-vis fake news. The five items include fake news themes, types, sources, platforms and orientations. Analyzing 125 fake news items, the results of Al-Zaman's study indicated that the seven main themes of the fake news include "health, religiopolitical, political, crime, entertainment, religious, and miscellaneous" (p. 100). In addition, the results indicated that text and video were the prevalent types of fake news in the sample. Interestingly, based on the results of the article, most fake news came from different social media platforms including Twitter, Facebook, WhatsApp, and YouTube and the very small portion of them i.e., almost 5%, originated from mainstream media. Finally, the study illustrated that the orientation of more than half of the selected sample i.e., 56% of the items, were negative that could potentially affect the general public health.

Other studies, such as the one conducted by Rodrigues and Xu (2020) in an article titled 'Regulation of COVID-19 Fake News Infodemic in China and India,' focused on infodemic management strategies and in particular the government responses to fake news both in India and China. The authors maintained that each country has its own regulations and policies to respond to and manage this issue.

Understanding the motivations behind sharing and disseminating fake news by social media users is an important issue, investigated by Apuke and Omer (2021). Employing use and gratification theory, the authors concluded that the most important motivations include "information sharing, socialization, information seeking and pass time. In contrast, no significant association was found for entertainment motivation" (p. 1). Lee et al., (2021) focused on the role of online news and social media in

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prevention action during the COVID 19 pandemic in South Korea. The results of their study indicated that "online news and social media influence preventive actions through the trust in citizens or in government". The results of their study also showed that "while online news media enhances trust in both the citizens and the government, social media only influences trust in citizens" (p.1). Olagoke, et al. (2020, p. 865) investigated "the association between the coronavirus news on mainstream media, risk perceptions, and depressive symptoms," and Wang (2021) compared the Chinese people's motivations to mainstream media and social media to receive news during the COVID-19 lockdown in China. He concluded that motivations to use mainstream media to gain and seek news and information were stronger, compared to alternative media.

Each of the above article concentrated on an important issue vis a vis the formation and the management of the COVID 19 infodemic. However, as observed, there is a lack of studies regarding the role of mainstream media in infodemic management. Accordingly, the present study aims to fill the gap in the existing literature by investigating the role of two Iranian mainstream media i.e. IRNA and Fars News Agency to manage infodemic during the pandemic. The study therefore aims to answer the following research questions:

RQ1. What are the most prevalent types of infodemic that are recognized and responded by IRNA and Fars Instagram pages?

RQ2. What are the most important infodemic themes that are recognized by IRNA and Fars Instagram pages?

RQ3. What are the main sources of infodemic used by IRNA and Fars in their Instagram pages?

RQ4. What are the most widely-used types of IRNA and Fars Instagram selected posts?

3. Research Method

This study employed a qualitative content analysis to answer the raised questions. "Qualitative content analysis is one of many qualitative methods used to analyze textual data" (Forman & Damschroder, 2007, p. 39). It is a method that has extensively been used for analyzing different types of media content.

3. 1. Sampling and Data Collection

Data for this study were selected from the Instagram pages of Fars News Agency (@fras_news) and Islamic Republic News Agency (IRNA) (Irna_1313). There are three reasons for this selection. First, as aforementioned, both of news agencies are mainstream media and for the aim of this paper, it is important to see how mainstream media manage infodemic. Second, both of them have a significant number of followers: Fras has 1.5 million followers and IRNA has 400 thousand followers. Third, both news agencies have taken a considerable attention to prevalent fake news and false information regarding the COVID-19. As an illustration, only one day after the official announcement regarding the identification of the first Corona case to Iran, Fars published a post titled "rumor is more dangerous than Corona," and tried to inform the readers regarding the potential threats of false news. Following that, both Fars and IRNA posted regular updates about the rumors that were spreading in the online sphere, in particular in different social media, and tried to provide clarification and fact checks for them. Data were collected from the aforementioned Instagram pages from

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February 19, 2019, the first day of the official announcement of discovering the first Corona case in Iran, until October 25, 2021. During this period, among the news related to the different aspects of COVID 19, only posts related to fake news, false information or contained concerns or questions of people vis-à-vis the pandemic were investigated. Taking the notion of infodemic management i.e. 'building resilience to misinformation' (WHO, 2021) into consideration for data collection, 154 items were selected from Fars and 64 items were selected from IRNA. In sum, 218 items were analyzed. It is important to mention that most of these news items were specified with false news hashtag[1] and were recognized as Corona rumors.

3. 2. Themes and Categories

To analyze the typology of infodemic contents covered by Fars and IRNA Instagram pages during the pandemic, four categories are recognized: 1) infodemic types, 2) Infodemic themes, 3) Infodemic sources, and 4) types of Instagram posts. Each of them has some subcategories that will be explained in the subsequent parts of the paper.

3. 2.1. Infodemic Type

For this category, six items were recognized: 1) fake news, 2) misconceptions, 3) prevalent public questions and concerns regarding Corona, 4) warnings, 5) negative frame explanations, and 6) distorted information.

In this study, fake news refers to any incorrect information presented as news. As an illustration, the 'contamination of red

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1. # فالس نیوز

meat with the Corona virus' is an example of a fake news. Misconceptions refer to wrong and inaccurate idea regarding the virus. 'Hot weather can destroy the Corona virus' is an example of misconception. The questions and concerns of the society regarding the side effects of the Corona vaccine' is an instance of the third category i.e., prevalent public questions and concerns regarding Corona. Answering these questions and concentrating on these issues by news agencies are important because if they are no appropriately answered, particularly by experts in the related fields, they have the potential to be the sources of fake news and misconceptions. Accordingly, this paper investigated how and to what extent Fars and IRNA focused on these issues. The fourth item, 'warning' refers to the posts that inform people about the possible scams and defrauds conducted by some groups that are mainly advertised in social media. For example, warnings on the activity of groups who do rapid Corona tests at homes is categorized in this section. Negative frame explanations refer to the posts that are not necessarily fake news or false information, but they include explanations regarding the negative frames that anti-Iranian media spread regarding different aspects of Corona in Iran. Finally, 'distorted information' refers to the contents that are not totally incorrect like fake news, but some parts of the correct information are cut or distorted. A prevalent type of that is cutting specific parts of a video to deviate it from its original message.

3. 2. 2. Infodemic Themes

This category is allocated to infodemic themes, because one of the key objectives of the paper was to investigate the main themes and topics of widespread fake news and false information regarding the Corona virus in Iran. To this end, eight categories are identified: 1) different government activities including government policies and

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functions to control and manage the pandemic, 2) health care
activities, 3) offering governmental or non-governmental services
to people, such as allocating free internet services, 4) health-
religion dichotomy, which is mainly offered by anti-Iranian media,
5) Corona virus prevention and treatment methods, 6) Corona
phobia, 7) vaccination, and 8) Miscellaneous. It is important to
mention that Corona phobia has four subcategories and vaccination
has also three subcategories. Corona phobia categories include 6.1)
exaggerated and false statistics of infected people or victims, 6.2)
strange and dangerous consequences caused by Corona virus such
as blackening of the skin, 6.3) unusual ways of spreading Corona
virus, 6.4) reporting fake news on death or infecting of famous
people. This is categorized under Corona phobia because
frequently hearing about the death or infecting famous people can
frighten people that the situation is very critical and dangerous. The
three categories of vaccination include: 7.1) general issues
regarding vaccination, 7.2) efficiency and side effects of
vaccination, and 7.3) specific government activities and functions
regarding vaccination. In this regard, this category does not overlap
with the first category of government activities and policies to
manage Corona crisis. In the findings section, the statistics will be
explained and offered separately.

3. 2. 3. Infodemic Sources

This study also investigated the prevalent of infodemic sources by
identifying four categories: 1) Social networking sites, 2) anti
Iranian media, 3) Governmental and official websites and
authorities and 4) ambiguous, which refers to the sources that were
not clear.

3. 2. 4. Type of Instagram Posts

For the first category, five types of Instagram posts were recognized: 1) text, 2) photo & text, 3) video, 4) motion graphic and 5) infographic.

4. Findings

In this section, the most important findings of the paper regarding managing infodemic by IRNA and Fars news will be revealed and discussed. Accordingly, as an important part of the process, research questions will be reviewed.

RQ1. What are the most prevalent infodemic types that are recognized and responded by IRNA and Fars News Agency Instagram pages?

To answer this question, six types of infodemic were identified. As illustrated in Table 1, the most dominant type of infodemic that were concentrated by IRNA was 'prevalent public questions and concerns regarding the Corona virus' and by Fars was 'fake news'. Other priorities by IRNA include: misconceptions, fake news, warnings and distorted information. As can be seen, IRNA mainly focused on prevalent public questions and concerns and misconceptions regarding the Corona virus. Notably, three forth of its items i.e., 75% were situated in these two categories. Fake news is the third priority with almost 20% of the items. There are only 3 items allocated to warnings and distorted information, and as can be seen, IRNA did not allocate any items to negative frame explanations. Other priorities by Fars include: prevalent public questions and concerns regarding the Corona virus, negative frame explanations, misconceptions, warnings, and distorted information.

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In sum, the most prevalent types of infodemic recognized by both of the selected news agencies were 1) fake news, 2) prevalent public questions and concerns regarding the Corona virus, 3) misconceptions, 4) negative frame explanations, 5) warnings, and 6) distorted information. Table 1 summarizes the information.

Table 1. The most prevalent types of infodemic recognized by IRNA and Fars Instagram pages

Types of infodemic	IRNA		Fars		IRNA & Fars	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Fake news	13	20.3	102	66.2	115	52.7
Misconceptions	19	29.7	7	4.5	26	11.9
Prevalent public questions and concerns regarding Corona	29	45.3	20	13	49	22.5
Warnings	2	3.1	4	2.6	6	2.8
Negative frame explanations	0	0	17	11	17	7.8
Distorted information	1	1.6	4	2.6	5	2.3
Total	64	100	154	100	164	100

Source: Author

RQ2. What are the most important infodemic themes that are recognized by IRNA and Fars New Agency Instagram pages?

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The analysis of the findings in Table 2 indicates that the most important infodemic themes highlighted by IRNA consist of vaccination and Corona phobia. Out of 64 news items related to infodemic, IRNA allocated 24 items to vaccination and 23 items to different topics vis-à-vis Corona phobia.

The individual categories in Table 2 illustrate that items related to 'unusual ways of spreading Corona virus' is the first widespread infodemic theme that is covered by IRNA. Furthermore, approximately 30% of the IRNA Instagram posts are allocated to this topic. The second and third most prevalent topics are 'general issues regarding vaccination' and 'efficiency and side effects of vaccination,' which constitute 15.6% and 12.5%, of the entire IRNA Instagram posts, respectively. Other themes covered by IRNA include 'Corona virus prevention and treatment" (10.9%), government activities in general (9.4%) and government activities and functions regarding vaccination, in particular (9.4%), 'offering governmental or non-governmental services' (4.7%), 'exaggerated and false statistics of infected or victims (4.7%) and both 'strange and dangerous consequences caused by Corona virus' and 'health care activities' with 1.6% at the end of the list.

Table 2 also indicates the most important infodemic themes covered by Fars News Agency. As illustrated in Table 2, the themes related to Corona phobia constitute the top priority of Fars (32.3%), followed by items related to vaccination (20.7%). The analysis of the individual categories of themes indicates that the most important infodemic themes that are covered by Fars are as follow: 'government activities' (18.2%), 'general issues regarding vaccination'(12.3%), 'exaggerated and false statistics of infected or victims'(11%), 'fake news on death or infecting of famous people'(9.7%), 'health-religion dichotomy' (9.1%), 'specific

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government activities and functions regarding vaccination' (8.4%), 'strange and dangerous consequences caused by the Corona virus', (5.8%), 'unusual ways of spreading the Corona virus' (5.8%), 'health care activities'(3.9%), 'offering governmental or non-governmental services'(3.2%) and 'Corona virus prevention and treatment (3.2%).

It is also important to see how both news agencies concentrated on infodemic themes. Except the two main categories i.e., Corona phobia and vaccination, which come on the top with 33.5% and 25.7%, respectively, the analysis of other individual items are as follow: fake news on 'government activities' regarding the management of corona virus with 15.6% comes first. 'General issues regarding vaccination' with 13.3% is the second important theme. 'Unusual ways of spreading the Corona virus' with 12.8% is the third important theme. Other important themes include 'exaggerated and false statistics of infected or victims'(9.2%), 'specific government activities and functions regarding vaccination' (8.7%), 'fake news on death or infecting of famous people'(6.9%), 'health-religion dichotomy' (6.4%), 'Corona virus prevention and treatment (5.5%), 'strange and dangerous consequences caused by the Corona virus', (4.6%), 'offering governmental or non-governmental services'(3.7%), 'efficiency and side effects of vaccination' (3.7%) and 'health care activities'(3.2%).

Table 2. The most important infodemic themes recognized by IRNA and Fars Instagram pages

Infodemic themes		IRNA Frequency	IRNA Per cent	Fars Frequency	Fars Per cent	IRNA & Fars Frequency	IRNA & Fars Per cent
Government activities		6	9.4	28	18.2	34	15.6
Health care activities		1	1.6	6	3.9	7	3.2
Offering governmental or non-governmental services		3	4.7	5	3.2	8	3.7
Health-religion dichotomy		0	0	14	9.1	14	6.4
Corona virus prevention and treatment ways		7	10.9	5	3.2	12	5.5
Corona phobia IRNA (F*= 23) (P*= 36) Fars (F= 50) (P= 32.3) IRNA & Fars (F= 73) (P= 33.5)	Exaggerated and false statistics of infected or victims	3	4.7	17	11	20	9.2
	Strange and dangerous consequences caused by Corona virus	1	1.6	9	5.8	10	4.6
	Unusual ways of spreading Corona virus	19	29.7	9	5.8	28	12.8
	Reporting fake news on death or infecting of famous people	0	0	15	9.7	15	6.9
Vaccination IRNA (F= 24) (P= 37.5) Fars (F= 32) (P= 20.7) IRNA & Fars (F= 56) (P= 25.7)	General issues regarding vaccination	10	15.6	19	12.3	29	13.3
	Efficiency and side effects of vaccination	8	12.5	0	0	8	3.7
	Specific government activities and functions regarding vaccination	6	9.4	13	8.4	19	8.7
Miscellaneous		0	0	14	9.1	14	6.4
Total		64	100	154	100	218	100

Source: Author

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RQ3. What are the main sources of infodemics that IRNA and Fars referred to in their Instagram pages?

As depicted in Table 3, the main sources of infodemics covered by IRNA and Fars consist of social networking sites. While IRNA only referred to one news from anti-Iranian sources, Fars, provided clarifications on 44 news items that were spreading fake news regarding different aspects of the Corona virus by anti-Iranian media. It is also important to mention that governmental and official websites and authorities were in some cases the sources of infodemic; though with a low rate. There were also some items whose main sources were not clear: 53% of the IRNA items and 13.9% of Fars items belonged to this category.

Table 3. The main sources of infodemic that IRNA and Fars referred to in their Instagram pages

News agency / Infodemic sources	IRNA		Fars		IRNA & Fars	
	Frequency	Per cent	Frequency	Per cent	Frequency	Per cent
Social networking sites	28	43.8	83	53.2	110	50.5
Anti-Iranian media	1	1.6	44	28.6	45	20.6
Governmental and official websites and authorities	1	1.6	7	4.5	8	3.7
Ambiguous	34	53.1	21	13.6	55	25.2
Total	64	100	154	100	164	100

Source: Author

RQ4. What are the most widely-used types of IRNA and Fars Instagram selected posts?

As the illustrated in Table 4, the most widely-used types of posts used by IRNA to inform people about the Corona infodemic are text (32.8%), video (35.9%) and infographic (21.9%), while the

most widely-used types of posts used by Fras include photo and text (71.4%), video (20%) and text (6.5%). As can be seen, the rate of using infographic and motion graphic by Fars is rather low.

Table 4. The most widely-used types of IRNA and Fars Instagram selected posts

News agency / Type of Instagram posts	IRNA		Fars		IRNA & Fars	
	Frequency	Per cent	Frequency	Per cent	Frequency	Per cent
Text	21	32.8	10	6.5	31	14.2
Photo & text	3	4.7	110	71.4	113	51.8
Video	23	35.9	31	20.1	54	25.3
Motion graphic	3	4.7	1	0.6	4	1.8
Infographic	14	21.9	1	0.6	15	6.9
Total	64	100	154	100	164	100

Source: Author

Finally, analyzing IRNA and Fars Instagram posts indicated that Fars has used false news hashtag under 72% of its posts, while IRNA only used the mentioned hashtag in 20% of its posts. (See Table 5).

Table 5. Rate of using false news hashtag in IRNA and Fars Instagram posts

News agency / Fake news tags	IRNA		Fars		IRNA & Fars	
	Frequency	Per cent	Frequency	Per cent	Frequency	Per cent
Yes	13	20.3	112	72.7	125	57.6
No	51	79.7	42	27.3	93	42.7
Total	64	100	154	100	164	100

Source: Author

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5. Discussion

As aforementioned, one of the most important objectives of this research is to examine the way in which Iranian mainstream media manage and encounter spreading infodemic in the society in general, and on the Internet and on social networking sites, in particular. To this end, the first research question aimed to examine the most important types of infodemic that were covered by the Instagram pages of IRNA and Fars New Agency, as the two leading Iranian mainstream news agencies.

5. 1. Infodemic Types

The results of the study indicate that in managing infodemic, IRNA mainly focused on the prevalent public questions and concerns regarding the Corona virus. In this regard, by referencing to and interviewing with the original sources, it made a logical attempt for clarification regarding the issues. Interestingly, the second IRNA's propriety was explaining misconceptions regarding the different aspects of the Corona virus. In particular, in the early days of spreading the virus, mainly because it was unknown to the public, there were a great range of misconceptions vis-à-vis the various ways of spreading the virus and the different modes of prevention and treatment of the COVID-19 disease. Furthermore, there was a significant number of misconceptions regarding the dangerous nature of the Corona virus and the COVID-19 disease, which had the potential to provide stress and other psychological disorders to the citizens. As seen in the results of this article, by mainly concentrating on the 'prevalent concerns and questions of the society, as well as the main misconceptions about the virus, IRNA made an attempt to perform its social responsibility in managing the Corona-related infodemic. Other analysis indicate that in

addition to the two previous items, IRNA also directly concentrated on fake news. For this purpose, the news agency followed published and widespread news in other sources, in particular on the Internet and on social media, and provided a correct response to them. Normally these posts were distinguished from other posts by adding the hashtag Corona rumors. As indicated in Table 1, these three categories constitute more than 95% of the types of infodemic covered and explained by IRNA.

The result of the same issue for the Fars is significant . More than 66% of the infodemic items published on Fars News Instagram page is dedicated to fake news. As indicated in Table 5, the majority of these posts are labeled by false news hashtag. The strategy of Fars News Agency in response to fake news was similar to that of IRNA. At first, the specific fake news was explained with details to the readers. Then the explanations and clarifications of Fars regarding the false news were provided. Mainly, Fars did these elaborations by referring to original sources and informants, such as authorities in charge. This strategy was used as an effective strategy, since it could make trust among citizens. As the second priority, Fars concentrated on 'prevalent public questions and concerns regarding the Corona virus'. The main distinguishing point regarding Fars, was its coverage of and responding to the fake news and negative frames that were made by anti-Iranian media. The aim of these negative frames was twofold: to show that the situation of Iran was very critical and dangerous on the one hand, and to induce the weak capacity of the Iranian government to manage the pandemic, on the other. As an illustration, one prevalent frame at the early days of the pandemic in Iran, frequently repeated by the BBC Persian was to show Iran as the center of Corona virus in the world. In this regard, anti-Iranian

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news agencies tried to diffuse a specific type of Corona phobia among Iranians, which was part of their larger Iran-phobia agenda. The results of a recent study conducted by Kharazmi and Mohammadi (2020), titled 'Persian-Language Media Overseas as the Western Tools of Public Diplomacy: Framing COVID-19 Pandemic in Iran by VOA and BBC' provides evidences in this regard. According to the study, BBC and VOA framed "Iran at crisis, Iran as the source of regional and international threatening virus, lack of determination and confidence in decision making in Iran, Iran's incompetence and disqualification as an ill-equipped system" (Kharazmi & Mohammadi, 2020, p. 1). Accordingly, the concentration of Fars on these types of items as part its infodemic management project is worth mentioning.

In addition to the four types of infodemic mentioned above, there two other important types that received less priority. Among the whole sample of both news agencies, 6 posts contained warnings and 5 items focused on distorted information. Warnings are important, as they show the social responsibility of media to inform citizens regarding the fake services that are advertised and offered by non-authoritative and non-eligible agents. In the stressful situation of a critical pandemic, people may be persuaded and defrauded by offering fake services, such as free medical tests that may be harmful to them. Distorted information is also greatly misleading, which is the reason for which it received attention by the two news agencies studied in this paper. Altogether, it should be mentioned that both news agencies mainly concentrated on fake news, misconceptions and prevalent public questions and concerns regarding the Corona virus and less on warnings and distorted information. In addition, only Fars provided explanations about the negative frames of anti-Iranian media.

5. 2. Infodemic Themes

As observed in the findings section, the most important infodemic themes that were concentrated by IRNA and Fars were Corona phobia and vaccination. This issue seems logical. The reason for the existence of the great number of posts pertaining to Corona phobia is that, particularly in the early days of the virus spread in Iran, the phenomenon was unknown to the public and the probability for spreading fake news around what is unknown, is rather high. Among the sub categories of Corona phobia, IRNA covered contents discussing 'unusual ways of spreading the Corona virus, which indicates that the main concern of people was being infected by the virus in different ways. Rumors around this topic have been prevalent, and IRNA, as part of its information and education responsibility, provided appropriate responses to this concern. Another subcategory of Corona phobia, which is mostly focused by Fars, was 'exaggerated and false statistics of infected victims'. This was also another important concern among people, as they feared the dangerous nature of the virus and the increasing number of victims. In many cases, false statistics i.e., those that were in contrast with the statistics of WHO and the Ministry of Health and Medicine Education of Iran, were spreading in various social media. In this situation, different mainstream media, including Fars provided clarifications regarding the disease. Paying attention to the Corona phobia theme in general and its subcategories in particular, illustrates the significance of vaccination among people. Perhaps this is one reason for which we see 'vaccination' as the second important theme that provoked rumors in society. These rumors, as observed in the Instagram pages of IRNA and Fars, included different topics such as the successes of different countries to make the vaccine and the

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efficiency and side effects of vaccination for different groups in the
society, such as children, pregnant women, etc. In addition, one
part of the news was about the government activities to supply
vaccine for the whole society. The analysis of the IRNA and Fars
Instagram posts indicated that they managed this infodemic theme
by providing accurate information from the authorities, while
warning people not to be defrauded by groups that offer free and
fast vaccination.

Another important theme, prioritized by IRNA concerns
'Corona virus prevention and treatment. Emphasizing the above-
mentioned point vis-à-vis the concern of people regarding the
infection by virus, it is expected to see that people follow the news
and information regarding the prohibition or treatment of the
disease. In particular, there were widespread misconceptions and
unreliable information regarding the efficiency of certain
traditional treatments. It is also important to mention that almost
from the early days of the virus spread in Iran, there were
controversial debates among the society, as well as the health care
system regarding the efficiency and reliability of traditional
medicine. The issue has its proponents and opponents. The analysis
of IRNA Instagram posts indicates that this news agency managed
this infodemic theme by referring to reliable and scientific sources
and informants. However, as illustrated by the statistics revealed in
Table 2, Fars, did not widely focus on this issue.

The other important theme that is prioritized by both IRNA and
Fars, consists of government activities and capacities /
responsibilities in managing the Corona virus. Table 2 indicates
that IRNA allocated almost 19% of its infodemic items to explain
the rumors that exist about the efficiency of the government. It is
important to mention that out of these 19%, 9.4% relate to the

general functions of the government and the rest (9.4%) relate to the specific functions regarding vaccination. Similar findings are observed in Fars: 18.2% regarding the general activities of the government and 8.4% regarding the specific functions for vaccination. It can be deduced that one of the main themes of fake news regarding the Corona crisis was government activities as the government is the main agent responsible for managing such cases. It is therefore expected that there would be news and attributions regarding the shortcomings and inadequacies of the government and authorities in efficiently handling the situation. Both Fars and IRNA therefore offered explanations regarding the rumors around the government activities.

A comparison of the themes prioritized by IRNA and Fars illustrates that two themes that were significantly highlighted by Fars, were not discussed by IRNA. The items include: 'fake news on death or infecting of famous people' and 'health-religion dichotomy'. As aforementioned, one type of infodemic on which Fars seriously concentrated was 'negative frame explanations,' made by anti-Iranian media. For instance, by attributing fake quotations to religious figures or distorting their speeches, anti-Iranian media attempted to induce the idea that religion is in contrast with modern health standards. Fars greatly concentrated on this issue and provided the original quotations and references made by religious figures. Moreover, there were widespread rumors regarding the death or infection of famous people, in particular, politicians and religious figures. These issues were undertaken by Fars, which, again, attempted to provide its followers with reliable information from authentic sources. Finally, it should be mentioned that among the studied items, the theme that was significantly addressed by both IRNA and Fars concerned 'general issues regarding vaccination'.

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5. 3. Infodemic Sources

One of the most important issues in analyzing infodemic is discovering the source of the infodemic as well as the correct/authentic source of the original news. It is interesting to observe the extent to which such infodemic came from unknown resources. Table 3 indicates that a great amount of infodemic addressed by both IRNA and Fars originates in social networking sites. In social media, people see various news or other information, for which that they do not necessarily have a clear reference; yet, without thinking about this issue, they easily share it in other groups or channels. Accordingly, within a short period of time, fake news spreads in different channels and people believe them as reality. In this regard, it is the duty of mainstream media to detect, explain and clarify fake news through reliable sources.

For the case of Fars news agency, almost 28% of the published infodemic were disseminated in anti-Iranian media. In addition to responding the infodemic originating from social networking sites, Fars, reported fake news and negative frames that were published in anti-Iranian media such as BBC Persian, Iran International, Radio Farda, etc. IRNA, however, did not concentrate on these sources. Another source of infodemic is governmental and official websites and authorities. This type of source was not highly used by any of the news agencies. In IRNA, there is only one news and in Fars there are 7 news that fall into this type of source. This indicates that in the situation of crisis, even the official sources make mistake and confusion. Accordingly, it is worthwhile that both Fars and IRNA consider these types of infodemic sources. The situation of spreading infodemic is somehow complicated and in many cases, the original sources of the fake news is not clear. As illustrated in Table 3, the rate of ambiguines sources is rather high.

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5. 4. Types of IRNA and Fars Instagram Posts

As indicated in Table 4, most of the items that were posted by Fars were a combination of text and photo (71.4%). However, IRNA mainly used the combination of video, infographic and motion graphic. As indicated in Table 1, most of the infodemic covered by IRNA concerned misconceptions about the Corona virus. In this regard, to educate and inform people about these misconceptions, IRNA mainly used infographic and motion graphic as well as videos, including interviews with the informants, which is rather consistent with the visual affordances of Instagram. Finally, it should be mentioned that the majority (72.7%) of infodemic posts that were published by Fars, had the false news hashtag, while only 1/5 of the IRNA news contained this hashtag.

6. Conclusion

This study investigated the modality of coverage and the management of infodemic spreading around the Corona virus in Iran from the early stages of the pandemic in the Instagram pages of two mainstream media i.e., IRNA and Fars News Agency. The two media were selected because they were significantly active in responding to fake news, misconceptions and the prevalent questions and concerns that people had regarding the Corona virus. As observed, both news agencies considered spreading fake news as a serious and challenging issue and through different strategies, they attempted to enlighten the society regarding them. A comparison of IRNA and Fars News Agency's infodemic management illustrates that Fars mainly concentrated on fake news and IRNA focused on the public questions and concerns regarding the COVID-19 disease. In addition to responding to fake news,

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which are mainly spreading in different social media, Fars, managed infodemic by explaining the negative frames that were made by anti-Iranian media such as BBC Persian, Iran International, Radio Farda, etc. .

Paying attention to the main themes and topics of infodemic is very important, as they can tell us what issues make people more concerned. The results of this study illustrated that the two common themes that are covered by both IRNA and Fars are issues related to 'Corona phobia' and 'vaccination'. 'Corona phobia,' which covers subcategories such as the unusual ways of spreading the Corona virus, the strange and dangerous complications caused by the Corona virus, exaggerated and false statistics of infected victims and reporting fake news on death or the infection of famous people has the great potential to attract fake news and rumors. In particular, in the early stage of the pandemic, neither people, nor even certain experts, had complete information regarding the disease. In this regard, both IRNA and Fars provided responses to the fake news. Furthermore, they provided informative contents in the form of video, infographic and motion graphics to educate people regarding their misconceptions about the disease and its possible complications. Similar scenarios happened for the other discussed themes and issues, such as vaccination and Corona prevention and treatment. Vaccination was also an important issue, raised and discussed by both news agencies, as it was considered as one of the ways through which the disease could be prevented. In addition, people have concerns regarding its efficiencies, probable side effects, the government's supply of enough doses, and their allocation to the people. As discussed in the findings section, both IRNA and Fars concentrated on vaccination related issues. The other similarity between Fars and IRNA is covering fake news regarding the government activities to manage the Corona crisis.

There were also some differences between the two news agencies in covering Fake news regarding COVID-19 disease. As an example, IRNA put a special attention on Corona virus prevention and treatment, but Fars concentrated on heath-religious dichotomy frames that were made by anti-Iranian media.

As discussed in this paper's findings, the origins of most of the fake news and rumors that were covered and responded by IRNA and Fars were social networking sites, in which people can easily produce content without consequences. One concerning issue regarding the anonymous nature of social media is that it is not clear whether these fake news and rumors are distributed unintentionally by ordinary people who are really concerned about the disease, or intentionally by groups that aim to impose pressure and stress to the society. Interestingly, there were frequent warnings by the Iranian Cyber Police regarding the intentional spread of fake news regarding the COVID-19 disease.

In general, the findings of the paper can be summarized as follow:

In terms of infodemic type, Fars and IRNA mainly focused on:

- Fake news
- The prevalent public questions and concerns regarding the Corona virus/COVID-19 disease
- Misconceptions regarding different aspects of the Corona virus

In terms of infodemic themes, IRNA and Fars mainly focused on:

- Corona phobia
- Vaccination

In terms of infodemic sources, IRNA and Fars mainly reported fake news from

- Social media

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Finally, it should be mentioned that managing infodemic, in particular during a crisis such as the COVID-19 pandemic, is significantly crucial. In addition to the mainstream media making attempt to provide clarifications and elaborations on the rumors that are intentionally or unintentionally spread in the society, people need to increase their media literacy to be able to identify fake news and false information. The results of this study helped understand the ways in which Iranian mainstream media contributed to the management of infodemic during the Corona virus crisis through "building resilience to misinformation,' and in this regard, they mainly focused on the content analysis of their Instagram pages. Due to the interactive nature of their Instagram pages, it is suggested that further studies focus on the typology of responses and comments that they received from their followers. Conducting the issue is worthwhile, as it can help gain an insight into the extent to which people agree or disagree with the explanations that are provided by the mainstream media.

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