


The information-seeking behavior of medical sciences students toward COVID-19 in mass and social media: A cross-sectional study

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Abstract

Background and Aims: During the COVID-19 pandemic, college students can access health-related information on the Internet to improve preventative behaviors, but they often judge the merits of such information and create challenges in the community. The aim of this study was to investigate information-seeking behaviors in regard to COVID-19 among students at Kerman University of Medical Sciences (KUMS) with the help of mass and social media.

Methods: The present study is a cross-sectional study, which was conducted using an online researcher-made questionnaire. An invitation to participate in the study was sent to 500 students at KUMS, of which 203 were selected according to the inclusion criteria and completed the questionnaire. Descriptive statistics were used to analyze the data.

Results: COVID-19 news was mostly obtained through social media platforms such as WhatsApp, Telegram, Instagram, radio, and television, as well as online publications and news agencies. Social media platforms such as WhatsApp, Telegram, Instagram, and satellite networks such as BBC contained the most rumors about COVID-19. Some of the most common misconceptions regarding COVID-19 were as follows: "COVID-19 is the deadliest disease in the world," "COVID-19 is a biological attack," and "COVID-19 disappears as the air temperature rises." In addition, most of the virtual training provided through mass media focused on "refraining from visiting holy places and crowded locations such as markets," "observing personal hygiene and refraining from touching the eyes, nose, and mouth with infected hands," and "the role of quarantine in reducing the incidence of COVID-19."

Conclusion: Our findings demonstrated that during the pandemic, students used social media platforms the most to obtain health-related information and these media have a significant impact on their willingness to engage in preventative behaviors and take the COVID-19 risk seriously.

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KEYWORDS

COVID-19, information-seeking behavior, mass media, social media

1 | INTRODUCTION

In December 2019, the first outbreak of coronavirus disease 2019 (COVID-19) was reported in Wuhan, China.^{1,2} As of February 21, 2022, confirmed COVID-19 cases were over 425 million with 5.9 million deaths reported worldwide.³ The symptoms of this disease are mild and treatable in 80% of patients but in others, the disease can be more severe and even lead to death.⁴ The uncertainty of the nature of the disease and the method of transmission and treatment has caused people to seek information on how to prevent and treat the disease.^{5,6} To prevent the rapid spread of the coronavirus as a global crisis, the World Health Organization (WHO) has recommended individuals stay home and follow the instructions until the virus is under control.⁷⁻⁹ Given the current situation and the need for more people to stay at home, training methods and people's access to health information and healthcare are crucial during the outbreak of COVID-19.¹⁰ Activities such as searching for information on health problems, disease information, health risk factors, and health promotion are called Health Information-Seeking Behavior (HISB).¹¹ People generally use different sources to gather information about COVID-19.¹²

Mass media are commonly used to keep people's information up to date and have the ability to influence health-related behaviors and perceptions.¹³ Social media tools, which can be accessed via apps on smartphones, are very popular as the easiest way to acquire the latest news^{14,15} and can potentially provide health information on a large scale and affect the behavioral outcomes of their audiences.^{16,17} According to a survey of 1003 American adults, they heavily relied on social media to stay informed about COVID-19.¹⁸ Li and Liu¹⁹ identified social media as an effective tool for encouraging Chinese individuals to adopt COVID-19 prevention behaviors. Recently, Atarodi et al.²⁰ stated that mass media and social media had played an effective role in raising the Iranian population's knowledge about COVID-19. On the other hand, Anwar et al.²¹ considered the fake news published about COVID-19 by the media as a cause of public fear and stress, long-term quarantine, and ultimately economic and social difficulties. A review also identified the media as a powerful tool for altering people's behavior and promoting community health, provided that it is used cautiously and wisely during pandemics.²²

The official announcement of the COVID-19 outbreak led to the public's stress and concern. Governments, including the Iranian government, have opted to combat COVID-19 with extensive media coverage of information regarding this disease. This is due to the fact that many people follow health advice, but due to the differences in the levels of e-literacy in individuals, as well as the impact of this information and the experience and beliefs of people in determining health needs and decisions,²³ it is necessary to pay attention to the information-seeking behavior of individuals in different social groups. Students are one of these groups whose understanding of information behavior is critical.²⁴ A survey of 14,916 students from 130 universities in Germany

found that they often used search engines, news portals, and public websites to search for information about COVID-19.²⁵ The results of an online survey of 228 students in the Philippines reported their fear of the virus, which was probably due to the news published via Facebook.²⁶ In southern Iran (Bushehr), students considered symptoms such as fever, dry cough, and shortness of breath as the main symptoms of coronary heart disease while they were unaware of the digestive problems caused by this disease.²⁷ In Ahvaz (southern Iran), a survey of 527 students revealed that searching for COVID-19 information on the Internet, as the most important and accessible information source, has numerous advantages, such as updating the students' knowledge and helping them become more prepared in the face of COVID-19.²⁸ A survey of 463 medical students at Mashhad University of Medical Sciences indicated that their level of awareness about COVID-19 was moderate.²⁹

Uncertainty about the role of medical students during COVID-19 outbreaks has made student participation inpatient services a controversial issue.³⁰ This has led to the adoption of different approaches by institutions. Students can be a very high-risk group in spreading the coronavirus, as one of the most dynamic, young, and healthy groups, but they do not take COVID-19 seriously and are present in society. Eventually, they spread the infection to others as well. In addition, some hospitals recruit students to play a role in patient care, despite the fact that these students may not have received information about COVID-19 care. Therefore, our research team at Kerman University of Medical Sciences (KUMS) decided to study information and information-seeking behavior in this regard. Hence, we conducted this study to investigate the HISB of students of KUMS regarding the use of mass and social media to answer the following questions:

1. Which mass and social media are most often used by students during the outbreak of COVID-19?
2. To receive news related to COVID-19, which mass and social media are most often used by students?
3. From the students' point of view, which of the mass and social media spread the most misinformation about COVID-19?
4. From the students' point of view, what misconceptions about COVID-19 were spread on mass and social media?
5. How seriously did the students take the risk of COVID-19?
6. What care training did students receive via mass and social media during the outbreak of COVID-19?

2 | MATERIALS AND METHODS

2.1 | Study population and sample

The study population consisted of students from KUMS at the bachelor's level. Since students utilize mass media more than other

individuals, we selected them to participate in the study.³¹ After submitting the approval obtained from the ethical committee of KUMS to the vice-chancellor of this university, the phone numbers of 500 students were given to the researchers. We sent an invitation link to 500 students at KUMS through social network platforms and groups (WhatsApp and Telegram). Three hundred students accepted our invitation. Finally, 203 individuals were selected for the study according to the inclusion criteria. Inclusion criteria were as follows:

1. Being at least 18 years old.
2. Being a student at KUMS.
3. Being a resident of Kerman Province.

2.2 | Questionnaire development

The data collection tool was a researcher-made electronic questionnaire. The questionnaire was designed by reviewing the relevant literature^{21,32–35} and in accordance with the opinions of four medical informatics experts. These experts had 5–10 years of work experience in the virtual education department of medical universities in Iran. Moreover, to design this questionnaire, three 1-h sessions (3 h in total) were held among the research members. Finally, the questionnaire was created in five sections. The first part included demographic information of individuals (three questions), and the second part included questions related to students' information-seeking behavior when using mass media. These questions included the mass media used by participants during the outbreak of COVID-19 (1 question), different sources of COVID-19 news (1 question), information sources spreading rumors about COVID-19 (1 question), misconceptions about COVID-19 (1 question), paying serious attention to COVID-19 (6 questions), and virtual training provided through mass media at the time of COVID-19 outbreak (15 questions). Demographic information questions and COVID-19 rumors were designed with two-option responses. Moreover, questions about the type and duration of mass media use, e-learning, paying serious attention to COVID-19, and media content was designed with five questionnaire response options.

The face and content validity of the questionnaire was confirmed by three experts in the field of medical informatics (with a history of scientific research activities related to virtual education). After 45 students completed the questionnaire, Cronbach's α and Kuder–Richardson for five-option and two-option questions were calculated to be 0.844 and 0.89, respectively,³⁶ indicating the reliability of the questionnaire (≥ 0.7).³⁷

Finally, after confirming its validity and reliability, the questionnaire was designed using Google Forms (Supporting Information: Appendix A).

2.3 | Data collection

Before sending the questionnaire link to the participants, we completed several questionnaires to estimate the time required to

fill out each questionnaire. Then, the link to the questionnaire was sent to the participants through social network platforms (WhatsApp and Telegram) and it was explained to them that on average, each questionnaire will take 10–15 min to complete. The questionnaire link was sent to individuals from December 1 to December 30, 2020. In total, 203 participants completed the questionnaires.

Along with the link, an audio guide file about the content of the questionnaire and how to complete it was sent to the participants. The phone number of one of the researchers was also mentioned in this file so that the participants could contact him if required and ask their questions. All the questions of the questionnaire were defined as essential so that all of them were answered. Therefore, the participants answered all the questions.

2.4 | Data analysis

The demographic characteristics of individuals were presented by frequency and percentage. In addition, descriptive statistics (percentage, mean, standard deviation) were used to analyze other parts of the questionnaire. SPSS 22.0 was employed to perform these analyses.

After the students responded to the questions, the responses were stored on Google Forms. Eventually, all the students' responses were retrieved in an Excel file and imported to SPSS 22.0.

3 | RESULTS

Table 1 shows the demographic information of the participants. The frequency of male participants was more than females. The highest age group was 28–37. Moreover, 38 participants (18.69%) suffered from COVID-19.

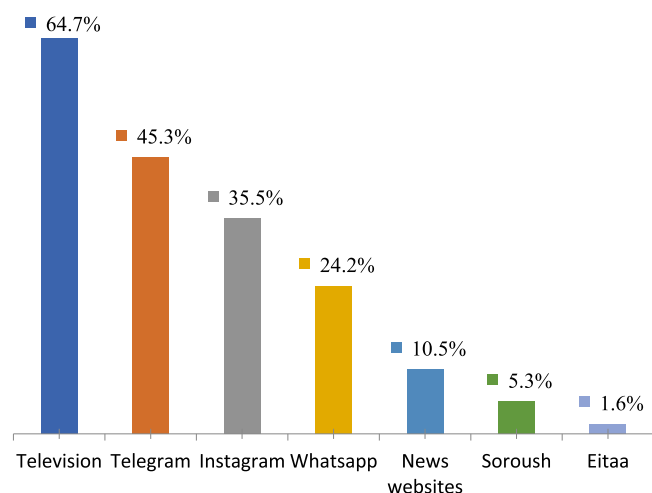
At the time of the COVID-19 outbreak, television (64.7%), Telegram (45.3%), and Instagram (35.5%) were the most used mass media by the participants. Soroush (5.3%) and Eitaa (1.6%), which are messengers designed in Iran, had the lowest usage by the participants (Figure 1).

We also compared different sources of news, that is, mass media and other sources of news. According to the participants, social network platforms, such as WhatsApp, Telegram, and Instagram (63.3%), radio and television (57.4%), and physicians and healthcare personnel (31.1%) were the most common sources for receiving news related to COVID-19, in that order (Table 2). Furthermore, satellite networks such as BBC (6.8%) were the least used source for receiving COVID-19 news.

Over 1 day (24 h), 163 participants (79.87%) followed news related to COVID-19 through the mass media for less than 2 h, 25 participants (12.5%) followed the news between 2 and 4 h, 12 participants (5.88%) followed the news between 5 and 7 h, and 3 participants (0.98%) for more than 7 h. Fake news was mostly published through social network platforms, such as WhatsApp, Telegram, and Instagram (57.4%), satellite networks such as BBC (33.2%), and family, relatives, and friends (30%) (Figure 2).

TABLE 1 Participants' demographics.

Variables	Frequency	Percentage
Sex		
Male	156	76.75
Female	47	23.12
Age		
18–27	72	35.5
28–37	105	51.7
37–46	17	8.4
≥47	9	4.4
COVID-19		
No	165	81.18
Yes	38	18.69

**FIGURE 1** Mass and social media used by participants during the outbreak of COVID-19. Participants could select more than one media.**TABLE 2** Different sources of COVID-19 news.

Sources of COVID-19 news	Frequency	Percentage
Social network platforms such as WhatsApp, Telegram, and Instagram	126	66.3
Radio and television	109	57.4
Physicians and healthcare personnel	59	31.1
Family, relatives, and friends	56	29.5
Online newspapers and news agencies	25	13.2
Satellite networks such as BBC	13	6.8

Note: Participants could select more than one news source.

The most common misconceptions about COVID-19 were “COVID-19 is the deadliest disease in the world,” “COVID-19 is a biological attack,” and “COVID-19 disappears as the weather becomes warmer” (Table 3).

Table 4 shows whether the participants paid serious attention to COVID-19 or not. According to this table, during the outbreak of COVID-19, the highest number of participants left their homes to “buy food” once or twice a week (39%), went “walking” once or twice a week (27.6%), “went to a party” once or twice a month (37.9%), “went to nature” once or twice a month (35.5%), “bought clothes” once or twice a month (31.5%), and went “mountaineering” once or twice a month (10.3%). Moreover, 14.8% of the participants never went out to “shop for food,” 48.8% never went “walking,” 54.7% never “went to a party,” 52.2% never “went to nature,” 62.1% never “bought clothes,” and 79.8% never went “mountaineering” (more information in Table 4).

The most common virtual training provided through virtual media include “refraining from visiting holy places and crowded locations such as markets,” “observing personal hygiene and refraining from touching the eyes, nose, and mouth with infected hands,” and “the role of quarantine in reducing the incidence of COVID-19.” In addition, the least common trainings were “how to make a mask at home,” “separation of masks and contaminated items from other household waste,” and “the effect of drinking fluids in preventing and reducing COVID-19” (Table 5).

4 | DISCUSSION

The general purpose of this study was to investigate the behavior of students at KUMS in seeking information about COVID-19 through mass and social media. This study was performed in the first 2 months of the COVID-19 outbreak in southern Iran (Kerman). Although the participants in this study were students, different age groups were covered. The most used mass media during the COVID-19 outbreak for most participants (90.6%) were TV, Telegram, and Instagram. Approximately 77% of the participants received the most COVID-19 news from social network platforms (such as WhatsApp, Telegram, and Instagram), radio, television, doctors, and healthcare personnel. The advantage of mass media news was that students received health education about COVID-19 prevention, including hand washing and reducing physical presence in public places, as well as the importance of quarantine. They also took the COVID-19 risk seriously by staying at home and limiting unnecessary travel. The disadvantages of mass media news were that they contained false news such as COVID-19 being deadly and its political nature from the participants' point of view, which was mostly published on social media and satellite networks outside Iran.

Since all participants in the study were university students who used the Internet, Internet resources and social media are expected to be the most common sources of health information. In our study, 66.3% of the participants followed COVID-19 news on social media. The most important reason is the method of sending healthcare information to the general public during the outbreak of COVID-19

FIGURE 2 Information sources spreading rumors about COVID-19. Participants could select more than one source of information.

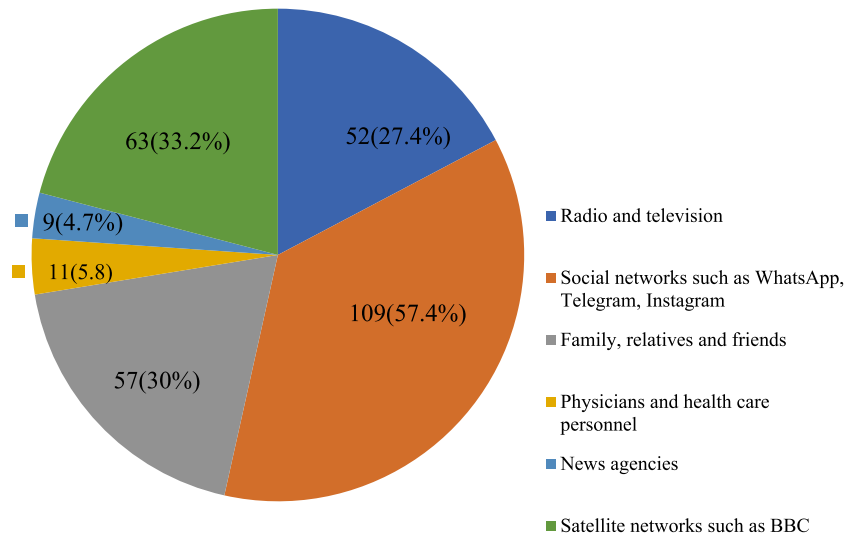


TABLE 3 Misconceptions about COVID-19.

Misconceptions about COVID-19	No (frequency [percentage])	Yes (frequency [percentage])
COVID-19 is the deadliest disease in the world	58 (28.42)	145 (71.05)
COVID-19 is a biological attack	75 (36.75)	128 (62.72)
COVID-19 disappears as the weather warms	163 (79.87)	40 (19.6)
COVID-19 is only lethal for the elderly with underlying diseases	170 (83.3)	33 (16.17)
COVID-19 can be prevented by injecting the pneumonia vaccine	192 (94.08)	11 (5.39)
Children do not get COVID-19	183 (89.67)	20 (9.8)

Note: Participants could select more than one misconception.

TABLE 4 Determining whether the participants paid serious attention to COVID-19.

Various activities during the outbreak of COVID-19	Frequency (percent)				
	Never	Once or twice a month	Once or twice a week	Once or twice a day	More than twice a day
Buying food	30 (14.8)	49 (24.1)	80 (39.4)	35 (17.2)	9 (4.4)
Walking	99 (48.8)	38 (18.7)	56 (27.6)	9 (4.4)	1 (0.5)
Going to a party	111 (54.7)	77 (37.9)	0 (0)	12 (5.9)	3 (1.5)
Going to nature	106 (52.2)	72 (35.5)	24 (11.8)	0 (0)	1 (0.5)
Buying clothes	126 (62.1)	34 (31.5)	9 (4.4)	3 (1.5)	1 (0.5)
Going mountaineering	162 (79.8)	21 (10.3)	20 (9.9)	0 (0)	0 (0)

(sending noncontact information). The constant variety and change of information about COVID-19 require an active platform such as social media for its rapid transmission across the community. In line with our study, a study by Schäfer et al.³⁷ showed that German students primarily searched for information on COVID-19 online. A study in Egypt also found that students preferred online websites to learn about the COVID-19.³⁸

Recent survey results show significant mass media use during the COVID-19 crisis.³⁹ At the time of the COVID-19 outbreak, some studies have confirmed the positive effect of using social media on increasing knowledge, attitude, ability to diagnose disease, and experiential

learning when faced with clinical conditions and situations.^{40–42} Easy access to care information, high attractiveness, and the possibility of group discussion and interactions on social media have not been ineffective in increasing the level of knowledge of their users.^{43–46} The results of a survey among students of Shiraz University of Medical Sciences (one of the southern cities of Iran) showed a high level of knowledge about COVID-19 and preventive behaviors.⁴⁷ The role of mass media, especially social media, in disseminating information (true or false) about COVID-19 to the general public is not hidden from anyone.^{36,48,49} In our study, the majority of students received primary education and care from social media to prevent COVID-19. Students

Types of virtual training	Mean (\pm SD)
Refraining from visiting holy places and crowded locations such as markets	4.52 (\pm 0.91)
Observing personal hygiene and refraining from touching the eyes, nose, and mouth with infected hands	4.46 (\pm 0.74)
The role of quarantine in reducing the incidence of COVID-19	4.39 (\pm 0.80)
Encouraging the elderly or people with underlying diseases to carry out self-care instructions to protect against COVID-19	4.35 (\pm 0.75)
Reducing the use of public transport	4.31 (\pm 0.98)
Regular use of masks and hand washing to prevent COVID-19	4.17 (\pm 0.84)
Limiting food consumption in restaurants during COVID-19	4.17 (\pm 1.11)
Observance of social distance	3.98 (\pm 0.89)
Proper nutrition and reduction of COVID-19	3.94 (\pm 0.97)
Reducing smoking, hookah, and alcohol consumption during the COVID-19 outbreak	3.94 (\pm 1.30)
The effect of stress on the weakness of the immune system during the COVID-19 outbreak	3.90 (\pm 1.16)
Visiting health centers after observing the symptoms of COVID-19	3.59 (\pm 1.31)
The effect of drinking fluids in preventing and reducing COVID-19	3.42 (\pm 1.07)
Separation of masks and contaminated items from other household waste	3.11 (\pm 1.37)
How to make a mask at home	2.18 (\pm 1.31)

TABLE 5 Virtual training provided through mass and social media during the COVID-19 outbreak.

can also be effective in disseminating information about COVID-19 because they often have a significant impact on those around them in terms of understanding the risk; the search for health information among young people (many of whom are students) is significantly higher than among other age groups.⁵⁰

University students as one of the most dynamic groups of people can have a great negative impact on the prevalence of COVID-19⁵¹ because students with an inadequate understanding of risk and prevention behaviors can underestimate the situation, reduce fear and anxiety, and disrupt appropriate preventive measures.⁵² Since in the past, students underestimated the level of risk themselves,⁵³ some universities had to close to prevent the spread of COVID-19 in this group of society.⁵⁴ In our study, however, some students (31%) did not take COVID-19 warnings on social media seriously. Failure to heed COVID-19 warnings may be due to various individual, cultural, social, economic, and structural factors within the Iranian society.⁵⁵

According to our study, with the spread of COVID-19, many rumors spread out in the community. For example, rumors such as "COVID-19 is the deadliest disease in human history" and "the coronavirus is deadly only for the elderly and those with underlying diseases" in the mass media are misleading information. According to a study by Wang et al., approximately 20% of patients with severe symptoms had a mortality rate of about 3%. On the other hand, severe acute respiratory syndrome, the first major infectious disease in the 21st century, with a mortality rate of 10%,⁵⁵ and the Middle East respiratory syndrome with a mortality rate of 30%⁵⁶ have been two widespread pandemics in the last two decades. Mass media has a great impact on human behavior because it can disseminate

information very quickly and easily. If fake news and misinformation are spread, their negative effect will cause the virus to spread faster and put more pressure on the health system.⁵⁶ For example, spreading the false news that "drinking alcohol has a protective role for COVID-19" through various social media platforms led to more than 3000 cases of poisoning and more than 700 deaths due to the consumption of fake alcohol in Iran.⁵⁷

Our study has several limitations that need to be considered. Our survey was conducted in a specific place and time range (on students at university). For this reason, the results of this study cannot be generalized to students of other universities or the general population of Iran because students have more access to smartphones and are more inclined to receive health information via the Internet.⁵⁸ Therefore, more extensive research should be carried out in other Iranian universities and at the national level. The survey was also conducted at a time when we only recorded findings related to the first wave of the disease. Due to the spread of COVID-19, researchers distributed the questionnaires to students online via social media. Therefore, students who were not on social media were not included in the study and the bias of data collection should be taken into account. Despite the limitations mentioned, the data were collected through self-report, and individual reports are limited due to biases such as introspective ability. Another limitation of our study was that the participants were only at the bachelor's level; thus, it is suggested that other students at different educational levels be considered in future studies. In addition, we only included participants aged 18 years old and above, and it is recommended that younger people be considered in future studies.

Our results provide an overview of COVID-19 information retrieval behavior among students of KUMS. The results revealed that information published on virtual social media is the most important source of health information related to COVID-19 among university students. Although these networks provide instant access to health information (including information on diseases, prevention methods, and treatment) in the community, they can also be a platform for disseminating inaccurate information. The results of the present study can be considered a starting point for implementing the policies and strategies of the National COVID-19 Headquarters and COVID-19 Control and Prevention Centers and to explore the potential of using social media to increase people's access to information and self-care services tailored to their needs during the pandemic. Finally, we recommend that social media users and administrators, university officials, institutions, and health organizations use social media effectively and consistently during epidemics such as COVID-19.

AUTHOR CONTRIBUTIONS

Parasto Amiri: Data curation; formal analysis; methodology; resources; visualization; writing—original draft; writing—review & editing. **Khadijeh Moulaei:** Formal analysis; methodology; resources; writing—original draft; writing—review & editing. **Kambiz Bahaadinbeigy:** Writing—review & editing. **Abbas Sheikhtaheri:** Visualization; writing—review & editing. All the authors took part in the entire study and approved the final manuscript.

CONFLICTS OF INTEREST

The authors declare no conflicts of interest.

DATA AVAILABILITY STATEMENT

Our data or material may be available from the corresponding author or first author upon reasonable request.

TRANSPARENCY STATEMENT

The manuscript is an honest, accurate, and transparent account of the study being reported; that no important aspects of the study have been omitted; and any discrepancies from the study as planned (and, irrelevant, registered) have been explained.

ETHICS STATEMENT

For this study, the code of ethics with the number IR.KMU.R-EC.1399.211 was obtained from the ethics committee of KUMS. Student participation in the study was voluntary.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

How to cite this article: Amiri P, Moulaei K, Bahaadinbeigy K, Ghaemi MM, Sheikhtaheri A. The information-seeking behavior of medical sciences students toward COVID-19 in mass and social media: a cross-sectional study. *Health Sci Rep.* 2022;5:e648. doi:10.1002/hsr2.648