

Coronavirus disease 2019 information-seeking behavior globally: a systematic review

SAGE Open Medicine

Volume 11: 1–7

© The Author(s) 2023

Article reuse guidelines:

sagepub.com/journals-permissions

DOI: 10.1177/20503121231153510

journals.sagepub.com/home/smo



Tadele Fentabil Anagaw¹ 
and Habtamu Alganah Guadie²

Abstract

Objective: This systematic review aimed to provide a global picture of information-seeking behavior, source information used, and its associated factors.

Methods: This systematic review followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses steps. Databases such as PubMed/MEDLINE, Web of Science, Scopus, EMBASE, World Health Organization libraries, and Google Scholar were used to search all published articles. Articles on COVID-19 information-seeking behavior published until November 04, 2021, and the use of the English language was included. Two independent reviewers did the article selection and quality check.

Results: For this systematic review, twenty articles were included in the final report. Information-seeking behavior was associated with digital health literacy, online information sources, and socio-demographic factors. The major sources of health information during the COVID-19 pandemic were digital media, television, public health portals like the world health organization, and center for communicable disease and prevention websites.

Conclusion: This systematic review provides a valuable overview of available information on information-seeking behavior regarding COVID-19 globally. The studies used a heterogeneous study population, various research techniques, and various research questions. Digital literacy and online information sources play a vital role in information-seeking behavior.

Keywords

Information-seeking behavior, COVID-19, systematic review

Date received: 09 August 2022; accepted: 09 January 2023

Introduction

Coronavirus disease 2019 (COVID-19) was declared a pandemic by the World Health Organization (WHO), and this pandemic has resulted in a significant crisis in the world.¹ Due to this disease, more than 663 million people have been affected by this pandemic, and 6.7 million have died due to the disease throughout the globe.² Currently, there are more than dozens of vaccines under development and implementation throughout the world to tackle the spread of the disease and minimize the associated morbidity and mortality.³

According to the WHO, health information is considered as one of the building blocks of the healthcare system.⁴ Information is vital for making evidence-based practice and improving the knowledge of the community in certain contexts.⁵ Information could be sought through various platforms; it could be through online sources, paper-based, family, and colleagues.⁶

Information-seeking behavior (ISB) means the modality of how people pursue information about their interests including health-related, economic-related, and social-related. Health information-seeking signifies how people sought health and health-related information. During pandemics, people need accurate and timely information from

¹Department of Health Promotion and Behavioral Science, School of Public Health, College of Medicine and Health Science, Bahir Dar University, Bahir Dar, Ethiopia

²Department of Health Informatics School of Public Health, College of Medicine and Health Science, Bahir Dar University, Bahir Dar, Ethiopia

Corresponding author:

Tadele Fentabil Anagaw, Department of Health Promotion and Behavioral Science, School of Public Health, College of Medicine and Health Science, Bahir Dar University, Bahir Dar, Amhara 079, Ethiopia.

Email: tadele27@gmail.com



Creative Commons Non Commercial CC BY-NC: This article is distributed under the terms of the Creative Commons

Attribution-NonCommercial 4.0 License (<https://creativecommons.org/licenses/by-nc/4.0/>) which permits non-commercial use, reproduction and distribution of the work without further permission provided the original work is attributed as specified on the SAGE and Open Access pages (<https://us.sagepub.com/en-us/nam/open-access-at-sage>).

different sources about the pandemic and its prevention methods.^{7,8}

According to evidence, ISB was significantly influenced by the source of information, the provider's intention, and the literacy level of the community, digital infrastructure, and economic well-being.^{7,9}

Studies showed that television, online websites, radio, social platforms, and health professionals serve as sources of information in healthcare settings.

Health professionals and people use different types of health information from the internet besides traditional sources of information.^{10,11}

Digital media plays a vital role in disseminating information quickly for a large population without any geographical limitation, which has a significant impact on health information dissemination in the healthcare sector.^{12,13}

Evidence indicates that information-seeking practice increased during pandemics and public health emergencies, and at these times health professionals and people need updated and accurate information for tackling the pandemic and protecting themselves.¹⁴ Public health emergencies and pandemics increased the need for timely and trustworthy health information globally;¹⁵ although there are some pieces of evidence regarding ISB during COVID-19, to the best of our knowledge, no systematic reviews have yet been done on COVID-19 ISB. A summary of evidence on people's ISB is needed to acquire suggestions for best evidence-based practice and future research to tackle the spread of the disease and promote the health of the community via updated and accurate information-sharing practice.

Therefore, this systematic review aimed to provide a global picture of ISB, source information used, and its associated factors.

Research question

1. What was the information-seeking behavior during COVID-19 globally?
2. What are the factors associated with information-seeking behavior toward COVID-19?
3. What are the sources of health information during COVID-19?

Method

This systematic review followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) procedure.

Search strategy

We have used online databases such as PubMed/MEDLINE, EMBASE, Web of Science, Google Scholar, WHO libraries, and African Journals to retrieve articles on the information-seeking behavior of COVID-19. The search term was

developed by using the following key terms: COVID-19, Information seeking behavior, and Boolean operators "AND" and "OR" used for this purpose.

Inclusion and exclusion

This systematic review includes all publications, which fulfill the following parameters: publications studying COVID-19 ISB were included, whereas publications in a language other than English, short reports, letters to editors, and discussions were excluded in the present systematic review.

Eligibility criteria

Included articles in this systematic review were all articles published in English, articles published until October 20, 2021, and all cross-sectional studies. We excluded articles based on the following criteria: articles with poor quality, study protocols, systematic reviews, unpublished articles, and letters for editors.

Data extraction

Articles extracted from databases were exported to Endnote software version 8 after removing the replicates; all articles were exported to a Microsoft Excel spreadsheet. Studies retrieved by using search terms from all databases and additional sources were screened for inclusion criteria. Then, articles that fulfilled the inclusion criteria were undertaken for full-text review for admissibility and extraction. PRISMA flowchart was used throughout all steps. Quality assessment was done by using the Newcastle-Ottawa Scale (NOS) criteria to include in this systematic review.¹⁶ This tool has ten points in the three domains of modified NOS components for observational studies. The studies which have scored ≥ 5 points were included.

Data analysis

Descriptive statistics were used to summarize the study's features. Characteristics of all the studies were summarized in textual and tabular methods including study population, study design, sample size, and data collection period. ISB of study participants and associated factors were clearly stated. The main outcome variable ISBs on COVID-19 have been explained textually.

Result

A total of 136 articles were retrieved from all sources after the removal of 65 duplicated articles and 71 articles were assessed by using titles/abstracts from the 41-article excluded due to not evaluating the outcome of interest (ISB). Thirty articles also underwent full-text review and finally, 20 were included in this review (Figure 1).

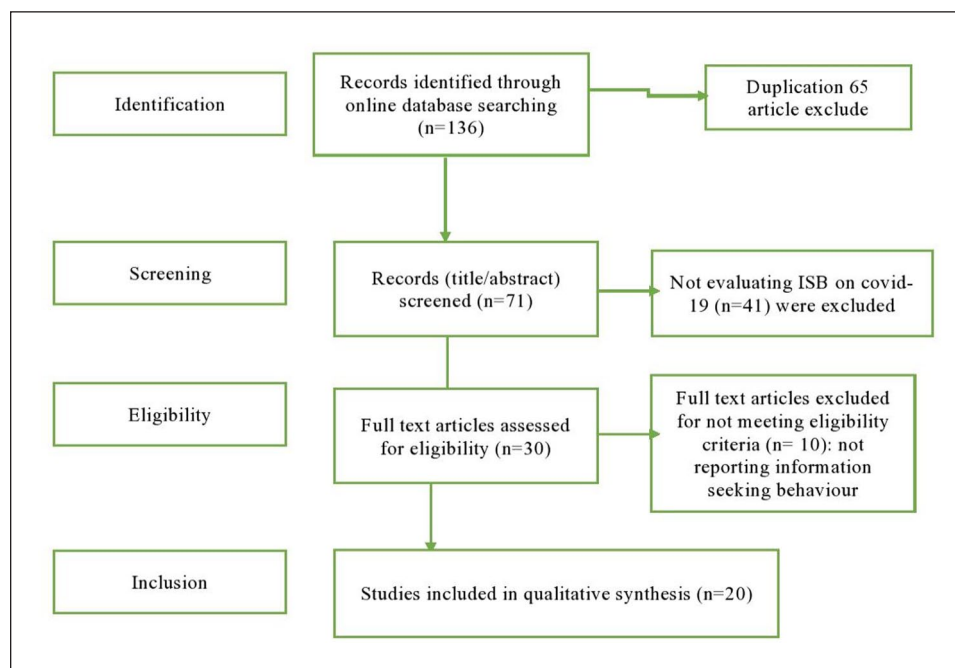


Figure 1. PRISMA flow chart of the study selection process on ISB on COVID-19 globally: a systematic review.

Characteristics of articles included in this review

This systematic review included studies on ISB and associated factors during COVID-19, studies published up to November 4, 2021, and 20 articles²⁰ that were published globally included in this review. The study design of all articles was cross-sectional. Five studies were done in the United States,^{17–21} three studies were done in China,^{22–24} and two studies were done in Germany^{25,26} (Table 1).

Factors affecting ISB toward COVID-19

Distinct populations and nations exhibit different ISBs. ISB in the general population of China was highest (90%) and lowest among immigrant women in the United States at only 60%. Of 20 studies included in this systematic review, most of the studies reported that digital literacy was the major contributing factor to ISB. This review included studies that reported the following factors as the most contributing such as perceived behaviors, mental status, practicing preventive behavior, presence of chronic conditions and risk behavior, internet access, computer training, digital health literacy, source of information, educational status, income level, sex, age, and knowledge (Table 2).

Discussion

This systematic review focused on articles done on ISB toward COVID-19 diseases worldwide. Information is one of the building blocks of the healthcare system as defined by the WHO. People need updated, accurate, and comprehensive

health information to protect themselves from pandemics and public health emergencies. As indicated by evidence, IS was considered one aspect of preparing and responding to health-related emergencies. This is due to that having information on a specific area/related to the disease makes the communities have awareness of that issue.

Most studies reported that digital literacy is a contributing factor to ISB;^{25,27,30} this might be because knowing, using, managing, and analyzing digital media could be an advantage for seeking information on the internet.

Online health information such as search engines, websites, and different portals was considered as vital sources of information during pandemics/public health emergencies;^{24–26,31,34,35} this might be due to the reason that internet and different online portals provide timely information, given the opportunity to access various types of information and opportunity for discussion. Source of health information was one of the factors for information-seeking behavior by various pieces of evidence; this might be because accessing various information sources help to find out triangulated information on the subject/COVID-19 and help to make timely decisions.

Risk perception, risk behavior, and practiced preventive behavior were major significant determinants of ISB across different countries.^{26,34} This might be because individuals who understand their risk level and risk behavior were eager to take measurements by getting information from different sources to avoid their risk and also those who practice preventive behaviors of COVID-19 want the information to know the right recommended preventive practice from their country policy and WHO recommendations.

Table 1. Characteristics of articles included in the present systematic review on ISB during COVID-19 epidemic globally.

Author	Year	Sample size	Country	Study design	Study population	Key findings
Dadaczynski et al. ²⁵	2021	14,916	Germany	CS	Student	DHL was significantly associated with ISB, major sources of information were the internet and social media
Liu et al. ²²	2020	511	China	Online survey	Adult population	Seeking COVID-19-related information on social media, mobile social networking apps, social live-streaming services, and online news media associated with preventive behaviors
Rosário et al. ²⁷	2020	3084	Portugal	CS	Students	Websites of public bodies associated with DHL and Digital health literacy associated with ISB
Kalayou et al. ²⁸	2020	291	Ethiopia	CS	Health care professionals	71.1% of participants sought information on covid-19, Age, working unit, taking computer training, computer and internet access, and frequency of internet use were significant factors
Chen et al. ²³	2020	1902	China	CS	General population	More than 90% sought information on COVID-19. Age and education were determinants of ISB
Zhao et al. ²⁴	2020	1496	China	Online survey	General population	The major source of health information was the internet; female users sought information regarding the topic
Skarpa et al. ²⁹	2021	776	Greece	Web-based survey	General population	The major factors that confronted information-seeking were: unreliable information, fake news, and information overload. Television, the internet, and social media were sources of information
Zakar et al. ³⁰	2021	1979	Pakistan	CS	Student	Digital health literacy was a significant factor in information seeking (IS)
Chisty et al. ³¹	2021	216	Bangladesh	CS	Adult population	Social media, television, and online-based news portals were the major sources of information
Superio et al. ³²	2021	228	Philippines	CS	Students	Television was the primary source of information and the internet. Misinformation is a big threat in social media
Avery et al. ¹⁷	2021	719	US	Online survey	Adult population	Knowledge was the major contributing factor for ISB. The major source of information used by participants was: television, newspaper, magazine, health professionals, family
Gunderson et al. ¹⁸	2021	1004	US	CS	General population	The presence of chronic conditions, gender, and educational status were contributing factors for ISB. The CDC website and the Florida department of health website were the major sources of health information, IS was associated with anxiety, depression, obsessive-compulsive symptoms
Loosen et al. ³³	2021	406	UK	CS	General population	IS was associated with anxiety, depression, obsessive-compulsive symptoms
Rayani et al. ³⁴	2021	325	Iran	CS	Undergraduate students	The sources of information were social media and the internet. Preventive behavior was associated with ISB
Vrdelja et al. ³⁵	2021	3621	Slovenia	CS	Student	Frequently used sources for IS for COVID-19 related information were: search engines, websites of public bodies, newspapers, social media, Wikipedia, websites of health professionals, health portals, web consulting services
Schäfer et al. ²⁶	2021	7417	Germany	CS	Student	80 % of participants sought information, the online source was the major source of information, risk perception and risk behavior were significant factors for ISB
Monzani et al. ³⁶	2021		Italy	CS	General population	ISB was highly associated with mental health
Jang et al. ¹⁹	2021	726	US	CS	Immigrant women	60 % of ISB among immigrant women
Neely et al. ²⁰	2021	1003	US	CS	General population	Sources of health information: CDC, state public health department, local public health department, infectious disease expert, WHO, Health professional
Fareed et al. ²¹	2021	19,496	US	CS	General population	IS was associated with income and educational status

CS= Cross-sectional study design; ISB= Information-Seeking behavior; CDC = Center of communicable disease control and prevention; DHL = Digital health literacy; IS= Information Seeking; WHO= World health organization; US= united states; UK= the United Kingdom.

Table 2. Determinants of COVID-19 ISB globally, a systematic review.

Determinant factors	Author
Behavioral factors	
Risk perceived	Gunderson et al. ¹⁸
Risk behavior	Loosen et al. ³³
Practiced preventive behavior	Rayani et al. ³⁴
Mental status (anxiety, depression)	Schäfer et al. ²⁶
Presences of a chronic condition	Monzani et al. ³⁶
Source of information	
Social media	Jang et al. ¹⁹
Internet	Liu et al. ²²
Health professional	Zhao et al. ²⁴
Public media and websites (Television, newspapers, magazines, websites of Health department, CDC, WHO)	Dadaczynski et al. ²⁵ Kalayou et al. ²⁸ Skarpa et al. ²⁹ Chisty et al. ³¹ Rayani et al. ³⁴ Rosário et al. ³⁷ Zakar et al. ³⁸ Vrdelja et al. ³⁹
Socio-demographic factors	
Income	Gunderson et al. ¹⁸
Educational status	Fareed et al. ²¹
Knowledge	Chen et al. ²³
Age	Zhao et al. ²⁴
Sex	Kalayou et al. ²⁸

The presence of a chronic condition and mental health problems (anxiety, depression, and obsessive-compulsive disorder) were the determinant factors significantly associated with ISB across the globe.^{18,33,36} The possible explanation might be that having a chronic condition increases their level of risk of acquiring COVID-19 infection and might develop fear as a motivation factor; so to prevent COVID-19 infection these individuals are more likely to seek information on different preventive behaviors recommended by different concerned bodies.

Educational status and income level as also socio-demographic factors significantly contributed to the ISBs of individuals with COVID-19 disease across the globe.^{18,21,23} These might be those who are educated and can read and understand the importance of having information to improve their health status and to protect themselves from outbreaks and higher income levels might be related to having different sources of information including the use of social media, internet access, and television, which directly determine ISB.

In this systematic review, knowledge is identified as a contributing factor, which determines ISB.¹⁷ The reason could be that those who were knowledgeable desired to know current facts about epidemics and novel approaches to halting their spread and minimizing their effects.

The study's limitations are largely due to the research studies included in this review, which were cross-sectional studies that could be viewed as snapshots of ISBs in each country or region. Different sampling strategies may partly explain the differences in information-seeking levels reported in various studies from a single country. Thus, the results should be interpreted with extreme caution since they cannot predict future changes in ISB. The results of this study can be used as an initial motivation and guide for future studies and ISB. Finally, due to the heterogeneity of the study population, we were unable to conduct a meta-analysis.

Conclusion

There are a limited number of studies investigating ISB toward COVID-19 disease, throughout the world, with heterogeneity in the study population, method, and research questions. ISB was associated with digital literacy, online health information sources, socio-demographics, and the presence of chronic condition-related factors. Digitally literate and having online information access prefer to seek information about COVID-19. There is a need to consider comprehensive digital literacy training packages for all population groups and provide updated information using public portals.

Author contributions

Both authors made a significant contribution to the conception and design, acquisition of data, or analysis and interpretation of data; took part in drafting, revising, or critically reviewing the article; gave final approval of the version to be published, and agree to be accountable for all aspects of the work.

Declaration of conflicting interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

Institutional review board statement

Ethical approval is not applicable for this systematic review since data from previously published studies in which informed consent was obtained by primary investigators was analyzed.

ORCID iD

Tadele Fentabil Anagaw  <https://orcid.org/0000-0002-0312-4119>

Data availability statement

Data supporting this systematic review are available in the reference section. In addition, the analyzed data that were used during the current systematic review is available from the corresponding author upon reasonable request.

Reference

1. Pedersen SF and Ho YC. SARS-CoV-2: a storm is raging. *J Clin Invest* 2020; 130(5): 2202–2205.
2. Ros M and Neuwirth LS. Increasing global awareness of timely COVID-19 healthcare guidelines through FPV training tutorials: portable public health crises teaching method. *Nurse Educ Today* 2020; 91: 104479.
3. Kaur SP and Gupta V. COVID-19 vaccine: a comprehensive status report. *Virus Res* 2020; 288: 198114.
4. World Health Organization. *eHealth at WHO*. World Health Organization, 2016.
5. World Health Organization. *Framework and standards for country health information systems*. World Health Organization, 2008.
6. Curtis KL, Weller AC and Hurd JM. Information-seeking behavior of health sciences faculty: the impact of new information technologies. *Bull Med Libr Assoc* 1997; 85(4): 402–410.
7. Graffigna G, Barelo S, Bonanomi A, et al. Factors affecting patients' online health information-seeking behaviors: the role of the Patient Health Engagement (PHE) model. *Patient Educ Couns* 2017; 100(10): 1918–1927.
8. Higgins O, Sixsmith J, Barry MM, et al. A literature review on health information-seeking behavior on the web: a health consumer and health professional perspective. *Eur Cent Dis Prev Control* 2011; 1: 1–9.
9. Xia L, Deng S and Liu Y. Seeking health information online: the moderating effects of problematic situations on user intention. *J Data Inf Sci* 2017; 2(2): 76–95.
10. Kocyigit BF, Akalton MS and Sahin AR. YouTube is a source of information on COVID-19 and rheumatic disease link. *Clin Rheumatol* 2020; 39(7): 2049–2054.
11. Percheski C and Hargittai E. Health information-seeking in the digital age. *J Am Coll Heal* 2011; 59(5): 379–386.
12. Banbury A, Nancarrow S, Dart J, et al. Telehealth interventions delivering home-based support group videoconferencing: systematic review. *J Med Internet Res* 2018; 20(2): e25.
13. Marhefka SL, Lockhart E, Turner DA, et al. Social determinants of potential ehealth engagement among people living with HIV receiving ryan white case management: health equity implications from project TECH. *AIDS Behav* 2020; 24(5): 1463–1475.
14. Kim K, Yang J, Jeon YJ, et al. The effect of information-seeking behaviors on prevention behavior implementation during the COVID-19 pandemic: mediating effects of anxiety and fear. *Epidemiol Health* 2021; 43: e2021085.
15. Gostin LO, Friedman EA and Wetter SA. Responding to COVID-19: how to navigate a public health emergency legally and ethically. *Hastings Cent Rep* 2020; 50(2): 8–12.
16. Wells GA, Shea B, O'Connell D, et al. *The Newcastle-Ottawa Scale (NOS) for assessing the quality of nonrandomized studies in meta-analyses*. Oxford, 2000.
17. Avery EJ and Park S. Perceived knowledge as [Protective] power: parents' protective efficacy, information-seeking, and scrutiny during COVID-19. *Health Commun* 2021; 36(1): 81–88.
18. Gunderson J, Mitchell D, Reid K, et al. COVID-19 information-seeking and prevention behaviors in Florida, April 2020. *Prev Chronic Dis* 2021; 18: 1–11.
19. Jang SH and Jung G. How does COVID-19 differ from the flu/cold? A study of multilevel information seeking among Korean immigrant women in the U.S. *Am J Health Behav* 2021; 45(4): 665–676.
20. Neely S, Eldredge C and Sanders R. Health information-seeking behaviors on social media during the covid-19 pandemic among American social networking site users: survey study. *J Med Internet Res* 2021; 23(6): e29802.
21. Fareed N, Jonnalagadda P, Swoboda CM, et al. Socioeconomic factors influence health information seeking and trust over time: evidence from a cross-sectional, pooled analyses of HINTS data. *Am J Heal Promot* 2021; 35(8): 1084–1094.
22. Liu PL. COVID-19 Information seeking on digital media and preventive behaviors: the mediation role of worry. *Cyberpsychol, Behav Soc Netw* 2020; 23(10): 677–682.
23. Chen X, Gao H, Zou Y, et al. Changes in psychological well-being, attitude, and information-seeking behavior among people at the epicenter of the COVID-19 pandemic: a panel survey of residents in Hubei province, China. *Epidemiol Infect* 2020; 184: e201.
24. Zhao X, Fan J, Basnyat I, et al. Online Health Information Seeking Using “#COVID-19 Patient Seeking Help” on Weibo in Wuhan, China: descriptive Study. *J Med Internet Res* 2020; 22(10): e22910.
25. Dadaczynski K, Okan O, Messer M, et al. Digital health literacy and web-based information-seeking behaviors of university students in Germany during the COVID-19 pandemic: cross-sectional survey study. *J Med Internet Res* 2021; 23(1): e24097.
26. Schäfer M, Stark B, Werner AM, et al. Health information seeking among university students before and during the corona crisis—findings from Germany. *Front Public Heal* 2021; 8: 616603.
27. Rosário R, Martins MRO, Augusto C, et al. Associations between covid-19-related digital health literacy and online information-seeking behavior among Portuguese university students. *Int J Environ Res Public Health* 2020; 17(23): 1–11.
28. Kalayou MH, Tilahun B, Endehabtu BF, et al. Information seeking on COVID-19 pandemic: care providers' experience at the University of Gondar teaching hospital, northwest of Ethiopia. *J Multidiscip Healthc* 2020; 13: 1957–1964.
29. Skarpa P El and Garoufallou E. Information seeking behavior and COVID-19 pandemic: a snapshot of young, middle-aged and senior individuals in Greece. *Int J Med Inform* 2021; 150: 104465.
30. Zakar R, Iqbal S, Zakar MZ, et al. COVID-19 and health information seeking behavior: digital health literacy survey amongst university students in Pakistan. *Int J Environ Res Public Health* 2021; 18(8): 4009.
31. Chisty MA, Islam MA, Munia AT, et al. Risk perception and information-seeking behavior during an emergency: an exploratory study on COVID-19 pandemic in Bangladesh. *Int J Disaster Risk Reduct* 2021; 65: 102580.
32. Superio DL, Anderson KL, Oducado RMF, et al. The information-seeking behavior and levels of knowledge, precaution, and fear of college students in Iloilo, Philippines amidst the COVID-19 pandemic. *Int J Disaster Risk Reduct* 2021; 62: 102414.
33. Loosen AM, Skvortsova V and Hauser TU. Obsessive-compulsive symptoms and information seeking during the Covid-19 pandemic. *Transl Psychiatry* 2021; 11(1): 309.

34. Rayani M, Rayani S and Najafi-Sharjabad F. COVID-19-related knowledge, risk perception, information seeking, and adherence to preventive behaviors among undergraduate students, southern Iran. *Environ Sci Pollut Res* 2021; 28(42): 59953–59962.
35. Vrdelja M, Vrbovšek S, Klopčič V, et al. Facing the growing COVID-19 infodemic: digital health literacy and information-seeking behavior of university students in Slovenia. *Int J Environ Res Public Health* 2021; 18(16): 8507.
36. Monzani D, Vergani L, Marton G, et al. When in doubt, Google it: distress-related information seeking in Italy during the COVID-19 pandemic. *BMC Public Health* 2021; 21(1): 1902.
37. Rosário R, Martins MRO, Augusto C, et al. Associations between covid-19-related digital health literacy and online information-seeking behavior among Portuguese university students. *Int J Environ Res Public Health* 2020; 17(23): 1–11.
38. Zakar R, Iqbal S, Zakar MZ, et al. COVID-19 and health information seeking behavior: digital health literacy survey amongst university students in Pakistan. *Int J Environ Res Public Health* 2021; 18(8): 4009.
39. Vrdelja M, Vrbovšek S, Klopčič V, et al. Facing the growing COVID-19 infodemic: digital health literacy and information-seeking behavior of university students in Slovenia. *Int J Environ Res Public Health* 2021; 18(16): 8507.