

Evaluation of COVID-19 Information-Seeking Behavior

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Received: 24 January 2022

Accepted: 06 July 2022

Abstract

The rapid spread of COVID-19 and its transformation into a pandemic has caused anxiety and worry, especially in patients with underlying diseases such as Cancer. The present study aimed to investigate the information-seeking behaviors to prevent COVID-19 disease in cancer patients in Kerman in 2020. The present study is an applied study of objectives and a descriptive-correlational study in its design and methodology. The research population included cancer patients admitted to Shahid Bahonar ,Afzalipoor Hospitals, and Javadalameh Clinic in Kerman. Out of 3000 patients, the sample size was randomly estimated to be 250 persons. This study's findings indicated that most patients needed Information about a healthy diet to boost their immune system against COVID-19 disease. Moreover, the patients were more likely to search for COVID-19 Information through simple search (common words that came to their mind). They frequently used COVID-19-related TV programs as a source of Information to raise awareness of the disease. The patients reported that reading or hearing shocking Information about COVID-19 made it difficult to access sources and Information related to the disease. Besides, the retrieved information helped them to identify COVID-19 symptoms. Most of the patients also stated that they washed their hands regularly with soap and water to prevent COVID-19 disease.

Keywords: COVID-19, Information-Seeking Behavior, COVID-19 Illness, Cancer, Prevention.

Introduction

In late 2019 and early 2020, many people in various countries became infected with the coronavirus (COVID-19) caused by the SARS-CoV-2 virus. The disease has caused various economic, political, social, and health challenges for countries worldwide. Some of these challenges are directly or indirectly related to informational dialogues because providing the right Information at the right time and disseminating it to the right audience can solve or reduce some challenges. However, some problems occurred during the COVID-19 crisis because various individuals and organizations began to produce and disseminate Information due to

special circumstances of COVID-19 diseases that most countries had rarely experienced (Ashrafi-rizi & Kazempour, 2020). Although health information literacy skills deal with individuals' uses of existing Information in different situations and evaluate it with their main values, the emphasis is on coordinated action in the case of an emergency pandemic. An information need is perceived within an individual's environment (Krikelas, 1983). When an individual understands that their Information is insufficient for making a decision or solving a problem, they try to do some activities to satisfy their need, leading to information-seeking behavior. According to Babrow and Matthias (2009), uncertainty from insufficient Information might lead to Information seeking. The concept of health information-seeking behavior (HISB) is defined as an active or purposeful behavior performed by an individual to obtain health information (Zimmerman and Shaw, 2020). Information-seeking behaviors have frequently been studied with a focus on chronic diseases such as diabetes and Cancer (Longo, Schubert, Wright., LeMaster, Williams & Clore, 2010; Kimiafar, Sarbaz, Sales, Esmaeili & Ghazvini, 2016)

A limited number of studies have addressed health information-seeking behaviors in patients or healthy individuals during an outbreak (Odlum & Yoon, 2018). With access to a large amount of online Information, half of the people do not know what to do with it. The wealth of Information may also raise people's perception of their diagnostic competencies (ICANotes, 2020). In forward-thinking planning, efforts should be made to reinforce the values and attitudes of collective responsibility to reduce carelessness and prevent overreaction. Health information literacy, defined as the ability of individuals to think about complex health issues and evaluate existing Information, can be part of the skills that influence how to promote, reinforce, and encourage effective behaviors during a crisis such as the current COVID-19 crisis.

The rapid spread of COVID-19 disease into a pandemic has caused people, especially patients with underlying medical conditions such as Cancer, to become anxious and worried due to the lack of reliable and sufficient Information about the virus. As the disease progressed, specialists in this field began to produce scientific and related Information. However, the problem is how people behave to access this Information. The processes for obtaining COVID-19 Information, such as identifying COVID-19 Information needs, identifying COVID-19 information sources, seeking COVID-19 Information, using COVID-19 Information for different purposes, and evaluating the obstacles for accessing and using COVID-19 information, are called COVID-19 information-seeking behavior. One of the problems for cancer patients in diagnosing COVID-19 Information needs is what type of Information is effective to help them prevent COVID-19. Identifying the validity and adequacy of COVID-19 information sources can be an information-seeking problem for patients. Selecting, searching, and collecting COVID-19 Information can also be a problem for patients. Thus, the present study aims to investigate COVID-19 information-seeking behaviors among cancer patients in Kerman to prevent this disease. To examine COVID-19 information-seeking behaviors among cancer patients, this study focused on people with Cancer information-seeking behaviors including patients' information needs, Information searching, the importance of Information, information sources, information-seeking barriers, and their preventive behaviors.

Literature Review

Given the novelty of COVID-19, there is a lack of research on COVID-19 information-

seeking behaviors among cancer patients in the world and Iran. Thus, the present study especially focused on cancer patients to explore their information needs, resources, information-seeking problems, and Informational use and its relation with preventive behaviors. This study can provide valuable insights to raise patients' awareness and use the retrieved Information to promote their health and reduce their anxiety, fear, and depression during the COVID-19 pandemic.

Skarpa and Garoufallou (2021) aim to investigate the public's Information seeking behavior on COVID-19 in Greece, and their results show that during the COVID-19 pandemic in Greece, people obtained Information about the disease mainly through television, electronic press, and news websites, not social media because of people's awareness of the spread of fake news. Chisty, Islam, Munia, Rahman, Rahman and Mohima's (2021) purpose was to study the current perception of COVID-19 and the relationship between risk perception and information-seeking behavior. They found that if people do not perceive the risk of any emergency and don't seek proper Information, raising awareness about a pandemic like COVID-19 and managing the emergency will be challenging. Neely, Eldredge and Sanders (2021) aim was to understand how health consumers have used social media to learn and stay informed about the COVID-19 pandemic, the extent to which they have relied on credible scientific information sources, and how they have gone about fact-checking pandemic-related Information. They understand that there is a heavy reliance on social media during the COVID-19 pandemic. Most social media users were unlikely to fact-check what they see on the Internet with a health professional, despite the high levels of mistrust in the accuracy of COVID-19-related Information on social media. Mangono et al. (2021) performed research to study the use of Google Trends to provide insights into and potential indicators of important changes in information-seeking patterns during pandemics such as COVID-19. Their findings showed that high demand for Information, corresponding with increasing searches for coronavirus linked to news sources regardless of the ideological leaning of the news source. The increase in searches for Information on COVID-19 care was paralleled by a decrease in searches related to other health behaviors, such as urgent care, doctor's appointments, health insurance, Medicare, and Medicaid. The purpose of Elia's (2022) study was to investigate the spread of COVID-19 Information among Tanzanians. His findings showed that COVID-19 Information was not shared ethically. Employed people are likelier to communicate Information on the pandemic on social media ethically. Sun, Hu, Grossman and Wang (2021) aim was a comparison of differences in Information seeking, trust of information sources, and use of protective behaviors (e.g., mask-wearing) among individuals in the US and China during the COVID-19 pandemic. Findings from this study showed that coordinated and consistent messages from governmental officials, health authorities, and media platforms are important to promote and encourage protective behaviors. The Ebrahim, Saif, Buheji, AlBasri, Al-Husaini & Jahrami (2020) study aims to assess the COVID-19 information-seeking behavior (COVID-19 ISB) among parents in times of uncertainty and its potential association with anxiety symptoms. Their findings show that the most reliable source for COVID-19 Information was the social media accounts of health organizations. The most restricting obstacles to seeking COVID-19 Information were the "spread of rumors" and the "massive information about the disease". Liu (2020) assessed preventive behaviors against contracting COVID-19 and tested mediation pathways linking four types of digital media consumption (social media, mobile social networking apps [MSNs], and online news media. They understand that seeking COVID-19-related Information on MSNs, SLSSs, and online

news media was directly associated with preventive behaviors. Odlum and Yoon (2018) assessed health information needs about Ebola, at distinct epidemic time points, through longitudinal tracking and content analysis of social media data, like tweets. They found that due to ongoing health information deficiencies, resulting in fear and frustration, social media was at times, an impediment and not a vehicle to support health information needs. They found that people use Twitter to capture real-time data to assess ongoing information needs, fear, and frustration over time. Liu and Jiang's (2021) aim was to study mediation pathways linking three types of health information acquisition behaviors (scanning, seeking, and discussing) to patient trust in physicians, mediated by patient-centered communication. His findings showed that both health information-seeking and discussing slumped. Among the three dimensions of health information acquisition, health information scanning and discussing directly affected patient trust. Zhao, Fan, Basnyat and Hu (2020) explored how people in China are using the Internet to seek health information during a pandemic, considering information needs and the role of social media. Their findings showed that the Chinese public uses the Internet as an important source of health information. The most searched Information included accessing medical treatment, managing self-quarantine, and offline support online. Nazione, Perrault and Pace's (2021)' aim was to study mediated and interpersonal information consumption, risk perceptions, general efficacy perceptions, and preventative behaviors specific to COVID-19 in the past seven days. He found that hand washing and some stronger COVID-19 preventative behaviors. Overall, mediated and interpersonal information exposure had minimal effects on perceived risk and general efficacy. Norr, Capron and Schmidt (2014) only studied the impact of website information on anxiety, not all formal information resources. The results of this study show that exposure to online medical information could increase the risk for anxiety and psychopathology in individuals with elevated intolerance of uncertainty. Soo, Abdul Mua'ti and Hamisah (2015) have studied Interpersonal sources as one information resource, not all. In Malaysia, people with Cancer accept doctors' emotional, structural, and informational support.

The choice of media influences people's understanding of the crisis (Utz, Schultz & Glocka, 2013). To understand how an organization can position itself as the most reliable information resource, information professionals must understand how forms and sources of crisis-related Information will affect different levels of public response to crisis response strategies (Moreno, Fuentes Lara & Navarro, 2020). The World Health Organization emphasizes health information-seeking behavior during the COVID-19 outbreak to help reduce the risk of anxiety and distress in the community (WHO, 2020). Seeking Information is often useful and critical to health and disease behaviors (Lambert & Loiselle, 2007). People have problems understanding health information and making good decisions in important conditions such as the COVID-19 pandemic (Ahmadi, Taghizadeh & Esmaeeli, 2021). Individuals rely on reputable information channels, including health organizations' and healthcare providers' official social media accounts (Qian et al., 2020). Reading or hearing shocking Information confuses, shocks, and makes the recipient anxious (Ashrafi-rizi & Kazempour, 2020). The global misinformation (infodemic) epidemic, which is rapidly spreading through social media and other mass media, poses a serious public health problem. The World Health Committee needed to help the media figure out what information to look for and make available to the public; otherwise, the media would sometimes go beyond the facts (Zarocostas, 2020). Keeping physical distancing effectively reduces the peak and epidemic of the COVID-19 disease (Prem et al., 2020). Health literacy is important for preventing non-communicable diseases by

investing in education, communication, and sustainable and long-term measures (Nutbeam, 2017). Almost half of the adults in Europe reported having health literacy problems and lacking the necessary competencies to take care of their health and the health of others (Sørensen et al., 2015). The bad news spread during the COVID-19 outbreak through online social networks such as WhatsApp, Telegram, etc., about the number of infected and dead people increased fear and anxiety (Keshavarz, 2015). In addition to the differences between various digital media for health information consumption, it is also important to understand the relationship between health information acquisition and preventive behaviors (Gonza'lez-Prendes & Resko, 2012, as cited in Ringel & Brandell, 2012). There is a significant relationship between health information and disease control behaviors (Gesualdo et al, 2010). Consuming Information about the disease can cause concern or anxiety about a person's health (Salkovskis & Warwick, 1986). In a low-income country, online health consumers' ability to retrieve relevant COVID-19 Information and their competencies in modifying scientific from unscientific internet-based Information is relatively low (Abdulai, Tiffere, Adam & Kabanunye, 2021).

According to the findings of different researchers in Information seeking behavior on COVID-19 that the researcher has followed in this study, researchers who have studied the use of Information seeking behaviors in the prevention of COVID-19 in general or thematically in Iran and the world are few. The aim and findings of the present research are different from those of mentioned literature in the above table. This study aims to investigate the Information-seeking behavior to prevent COVID-19 in people with Cancer in Kerman in 2020. The conceptual model of people with Cancer information-seeking behavior of COVID-19 and their preventive behaviors is illustrated in Figure 1.

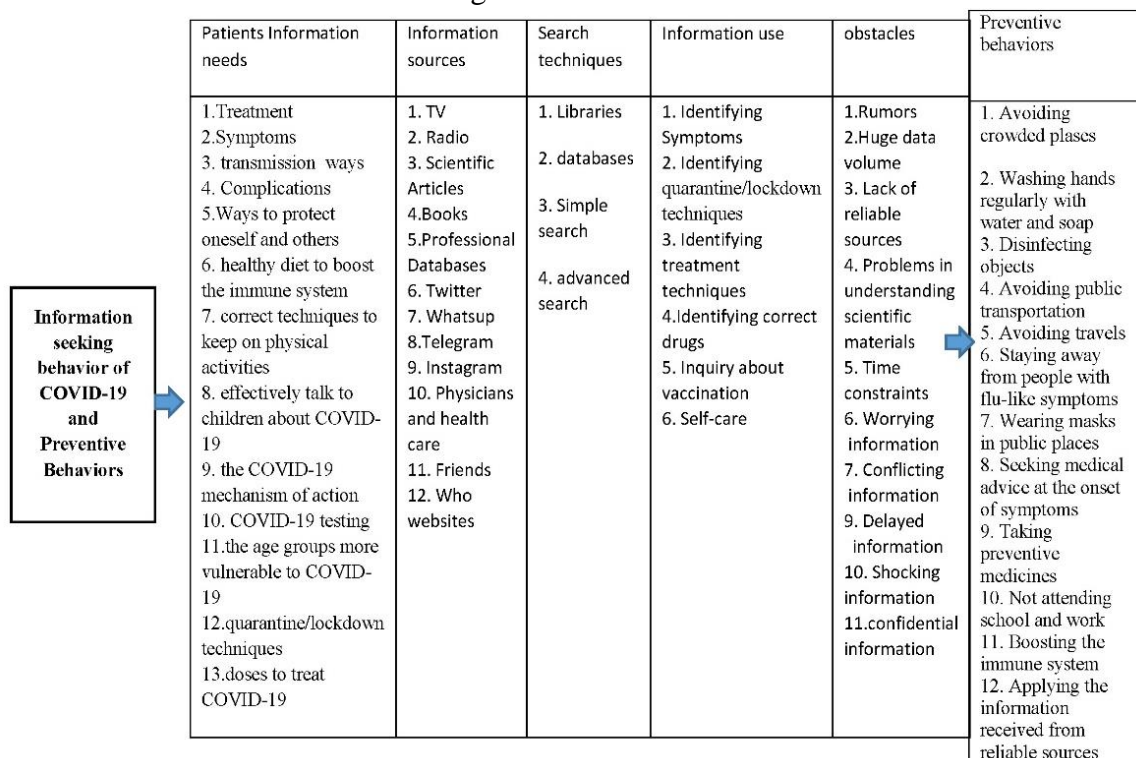


Figure 1: The conceptual model of the study (COVID-19 information-seeking behaviors and preventive behaviors)

Materials and Methods

The present study employed a correlational design to investigate COVID-19 information-seeking behaviors of cancer patients in Kerman province in 2020. The data were collected using library and survey techniques. The survey was conducted using a standard questionnaire developed by Ebrahim et al. (2020) with five points Likert Scale for investigating the information-seeking behavior of patients with Cancer. People with Cancer from all over Kerman province are treated in Afzalipur and Shahid Bahonar hospitals and Javad Al-Aeme clinic in Kerman city. Since most of these patients have already been treated, reaching them is impossible. Patients who are currently being treated in these three centers have been selected as a statistical population. The reason for choosing cancer patients is a special sensitivity that exists due to the low immunity of these patients and the possibility of their involvement in COVID-19. The statistics of cancer patients in 1399 have not yet been entered into the system of the Statistics Center. The available statistics, which are not precisely stated, show that the Afzali Hospital, Bahoner Hospital, and Javad Al-Aeme clinic patients were hospitalized in 1399 at the time of this study are almost 3000. The population sample size is 250 people, estimated based on Morgan's table. Because the year 1399 was the peak of the COVID-19 epidemic, it was difficult to reach patients to respond in different cities of Kerman province. One of the co-authors of this research is an oncologist. Together with the researcher, they collected 201 questionnaires under special conditions in Afzali and Bahoner Hospitals and Javad Al-Aeme clinic in Kerman. The questionnaires were distributed among the selected sample. The researcher read the questions to patients who could not read the questionnaire and verbally answered the questions. In this way, the researcher marked the options to which patients responded. In the case of patients whom a hygienic care provider accompanied, their care provider answered the questions. The Cronbach's alpha for the questionnaire was estimated at 0.943 and higher than 0.80, so the reliability of the questionnaire was confirmed. To evaluate the validity of the research tool, formal validity was used. The specialists shared their opinion on the questions in five options according to the Likert Scale, and received responses were in a proper and quite distinct range; therefore, they confirmed content and construct validity.

All statistical analyses were performed at a significance level of 0.05. The items in the questionnaire were scored using a five-point Likert scale (Strongly disagree = 1, disagree = 2, undecided = 3, agree = 4, and strongly agree = 5). The score for each variable was estimated as the mean of the scores of all items representing the variable. SPSS software version 23 is used for data analysis. The statistics used for analyzing data are descriptive, chi-square, and contingency tables.

Results

First hypothesis

The information needs of cancer patients to prevent COVID-19 are met satisfactorily.

The analysis of the data from 201 patients indicated that the mean of Information needed for the prevention of COVID-19 is 0.82, so the null hypothesis is rejected ($p < 0.05$), implying that the information needs of cancer patients to prevent COVID-19 were met satisfactorily (Tables 1, 2).

Table 1

Information needs of cancer patients to prevent COVID-19

Items	Strongly agree		Agree		Undecided		Disagree		Strongly disagree		Mean
	Frequency	%	Frequency	%	Frequency	%	Frequency	%	Frequency	%	
How to treat COVID-19	57	28.4	106	52.7	17	8.5	13	6.5	8	4	3.95
How to identify COVID-19 symptoms	55	27.4	101	50.2	19	9.5	18	9	8	4	3.88
How to know about how COVID-19 is transmitted	57	28.4	95	47.3	22	10.9	17	8.5	10	5	3.86
To identify COVID-19 complications	62	30.8	96	47.8	20	10	19	9.5	4	2	3.9
How to protect oneself and the family against COVID-19	67	33.3	98	48.8	16	8	16	8	4	2	4.03
To find out a healthy diet to boost the immune system against COVID-19	76	37.8	89	44.3	19	9.5	14	7	3	1.5	4.10
To know about correct techniques to keep on physical activities during the COVID-19 outbreak	69	34.3	95	47.3	25	12.4	10	5	2	1	40.09
How to effectively talk to children about COVID-19	66	32.8	93	46.3	22	10.9	16	8	4	2	4.00
To know about the COVID-19 mechanism of action	55	27.4	88	43.8	34	16.9	18	9	6	3	3.84
To know about COVID-19 testing	53	26.4	80	39.8	43	21.4	20	10	5	2.5	3.78
To know about the age groups more vulnerable to COVID-19	60	29.9	93	46.3	27	13.4	16	8	5	2.5	3.93
To know about quarantine/lockdown techniques	75	37.3	71	35.3	34	16.9	17	8.5	4	2	3.98
To know about doses to treat COVID-19	73	36.3	69	34.3	44	21.9	14	7	1	0.5	3.99
Total	891	443.3	1264	629	367	182.6	223	111.5	69	34.5	3.95

Table 2

The mean of the patients' Information needs to prevent COVID-19

The mean of the patients' Information needs to prevent COVID-19	0.82
Total number	201
P-value	<0.001*

* Significant at 0.05

Second Hypothesis

Cancer patients use effective search techniques to find Information to prevent COVID-19.

Data analysis revealed that the mean of Information needs to prevent COVID-19 is 0.42 ($p = 0.024$). Thus, the null hypothesis is rejected ($p < 0.05$), indicating that the cancer patients used relatively effective search techniques to find Information to prevent COVID-19 (Tables 3, 4).

Table 3

Search methods used by cancer patients to find COVID-19 Information

Items	Strongly agree		Agree		Undecided		Disagree		Strongly disagree		Mean
	Frequency	%	Frequency	%	Frequency	%	Frequency	%	Frequency	%	
Searching libraries	13	6.5	46	22.5	60	29.9	30	14.9	52	25.9	2.69
Searching databases	17	8.5	62	30.8	62	30.8	23	11.4	37	18.4	3.00
Simple search techniques	25	12.4	81	40.3	49	24.4	12	6	34	16.9	3.25
Advanced search techniques	19	9.5	56	27.9	60	29.9	22	10.9	44	21.9	2.92
Total	74	36.9	245	121.9	231	115	87	167	167	83.1	2.96

Table 4

The mean of the efficiency of search techniques used by the patients

The efficiency of search techniques used by the patients	0.42
Total number	201
P-value	<0.024*

* Significant at 0.05

Third hypothesis

Cancer patients have access to adequate COVID-19 information sources.

The study results showed that the adequacy of information sources used by cancer patients is 0.53 ($p = 0.397$). Thus, the null hypothesis is not rejected ($p > 0.05$), suggesting that the cancer patients had relatively good access to reliable sources to find Information to prevent COVID-19 (Tables 5, 6).

Table 5

The information sources used by the cancer patient sites

The information sources	Strongly agree		Agree		Undecided		Disagree		Strongly disagree		Mean
	Frequency	%	Frequency	%	Frequency	%	Frequency	%	Frequency	%	
TV programs	80	39.8	95	47.3	16	8	3	1.5	7	3.5	4.18
Radio programs	40	19.9	72	35.8	40	19.9	32	15.9	17	8.5	3.43
Scientific articles	30	14.9	72	35.8	50	24.9	32	15.9	17	8.5	3.33
Books	26	12.9	58	28.9	55	27.4	44	21.9	18	9	3.15
Professional databases	31	15.4	71	35.3	45	22.4	38	18.9	16	8	3.31
Twitter	31	15.4	51	25.4	55	27.4	38	18.9	26	12.9	3.11
WhatsApp	43	21.4	76	37.8	36	17.9	29	14.4	17	8.5	3.49
Telegram	30	14.9	69	34.3	44	21.9	35	17.4	23	11.4	3.24
Instagram	44	21.9	59	29.4	47	23.4	30	14.9	21	10.4	3.37
Physicians and healthcare professionals	47	23.4	94	46.8	40	19.9	10	5	10	5	3.79
Friends	34	16.9	94	46.8	35	17.4	25	12.4	13	6.5	3.55
WHO websites	32	15.9	62	30.8	58	28.9	21	10.4	28	13.9	3.24
Newspapers	17	8.5	54	26.9	67	33.3	33	16.4	30	14.9	2.98
Colleagues	23	4/11	74	8/36	58	9/28	28	9/13	18	9	28/3
Medical brochures	30	14.9	89	44.3	54	26.9	12	6	16	8	3.52
CDC and National Center for COVID-10 Control (NCCC) websites	36	17.9	66	32.8	60	29.9	19	9.5	20	10	3.39
New agencies	67	33.3	101	50.2	18	9	6	3	9	4.5	4.05
Total	641	318.7	1257	625.4	778	387.4	435	216.3	306	152.5	3.43

Table 6

The mean of the adequacy of information sources used by the cancer patients

The adequacy of search techniques used by the patients	0.53
Total number	201
P-value	<0.397

* Significant at 0.05

Fourth hypothesis

Cancer patients can effectively overcome obstacles to the prevention of COVID-19.

Data analysis revealed that the mean of the information needs of the cancer patients is 0.50 ($p = 1$). Thus, the null hypothesis is confirmed ($p > 0.05$), implying that the cancer patients had a moderate level of efficiency in overcoming the obstacles to the prevention of COVID-19 (Tables 7, 8).

Table 7

The obstacles faced by cancer patients in preventing COVID-19

Items	Strongly agree		Agree		Undecided		Disagree		Strongly disagree		Mean
	Frequency	%	Frequency	%	Frequency	%	Frequency	%	Frequency	%	
The spread of rumors	30	14.9	71	35.3	45	22.4	32	15.9	23	11.4	3.26
A huge volume of data about tumors and cancers	27	13.4	60	29.9	43	21.4	52	25.9	19	9.5	3.12
Lack of reliable information sources	29	14.4	67	33.3	42	20.9	50	24.9	13	6.5	3.24
Difficulty in understanding scientific materials	26	12.9	62	30.8	36	17.9	60	29.9	17	8.5	3.10
Time constraints	24	11.9	57	28.4	44	21.9	57	28.4	19	9.5	3.05
Sharing worrying Information	32	15.9	83	41.3	46	22.9	29	14.4	11	5.5	3.48
Conflicting Information about the disease	29	14.4	75	37.3	38	18.9	42	20.9	17	8.5	3.28
Confidential Information about the disease	31	15.4	62	30.8	47	23.4	43	21.4	18	9	3.22
Delayed Information	39	19.4	71	35.3	45	22.4	36	17.9	10	5	3.46
Doubtful Information	36	17.9	81	40.3	38	18.9	36	17.9	10	5	3.48
Reading or hearing shocking information/news	43	21.4	76	37.8	32	15.9	38	18.9	12	6	3.50
Total	346	171.9	765	380.5	456	226.9	475	236.4	169	84.4	3.29

Table 8

The adequacy of patients in overcoming the obstacles to the prevention of COVID-19

The adequacy of patients in overcoming the obstacles to the prevention of COVID-19	0.50
Total number	201
P-value	1

* Significant at 0.05

Fifth hypothesis

Cancer patients can effectively use COVID-19 Information.

Data analysis revealed that the mean of the use of COVID-19 Information by cancer patients is 0.82 ($p = 0.001$). Thus, the null hypothesis is rejected ($p < 0.05$), indicating that the cancer patients used COVID-19 Information effectively (Tables 9, 10).

Table 9

The use of COVID-19 Information by cancer patients

Items	Strongly agree		Agree		Undecided		Disagree		Strongly disagree		Mean
	Frequency	%	Frequency	%	Frequency	%	Frequency	%	Frequency	%	
Helping to identify COVID-19 symptoms	58	28.9	110	54.7	18	9	8	4	7	3.5	4.01
Helping to identify quarantine/lockdown techniques	58	28.9	103	51.2	24	11.9	11	5.5	5	2.5	3.99
Helping to identify treatment methods	46	22.9	116	57.7	24	11.9	9	4.5	5	2.5	3.96
Helping to identify effective doses for treatment	34	16.9	91	45.3	51	25.4	20	10	5	2.5	3.64
Inquiry about COVID-19 vaccines	46	22.9	73	36.3	58	28.9	15	7.5	9	4.5	3.66
Helping in caring for oneself	46	22.9	105	52.2	36	17.9	7	3.5	7	3.5	3.88
Total	288	143.4	598	297.4	211	105	70	35	38	19	3.85

Table 10

The use of COVID-19 Information by cancer patients

The efficiency of the use of COVID-19 Information by cancer patients	0.82
Total number	201
P-value	<0.001*

* Significant at 0.05

Sixth hypothesis

Cancer patients engage in effective COVID-19 prevention behaviors.

Data analysis revealed that cancer patients' mean COVID-19 prevention behaviors are 0.96 ($p = 0.001$). Accordingly, the null hypothesis is rejected ($p < 0.05$), showing that the cancer patients engaged in effective COVID-19 prevention behaviors (Tables 11, 12).

Table 11
COVID-19 prevention behaviors by cancer patients

Items	Strongly agree		Agree		Undecided		Disagree		Strongly disagree		Mean
	Frequency	%	Frequency	%	Frequency	%	Frequency	%	Frequency	%	
Avoiding crowded places	117	58.2	70	34.8	5	5	4	2	5	2.5	4.44
Washing hands regularly with water and soap	129	64.2	59	29.4	10	5	2	1	1	0.5	4.56
Disinfecting objects	120	59.7	62	30.8	13	6.5	5	2.5	1	0.5	4.47
Avoiding public transportation	117	58.2	60	29.9	13	6.5	11	5.5	0	0	4.41
Avoiding travels	119	59.2	65	32.3	12	6	2	1	3	1.5	4.47
Staying away from people with flu-like symptoms	123	61.2	65	32.3	9	4.5	3	1.5	1	0.5	4.52
Wearing masks in public places	122	60.7	69	34.3	6	3	3	1.5	1	0.5	4.53
Seeking medical advice at the onset of symptoms	82	40.8	92	45.8	16	8	8	4	3	1.5	4.20
Taking preventive medicines	74	36.8	64	31.8	33	16.4	22	10.9	8	4	3.87
Not attending school and work	93	46.3	63	31.3	31	15.4	11	5.5	3	1.5	4.15
Boosting the immune system	108	53.7	72	35.8	19	9.5	2	1	0	0	4.42
Applying the Information received from reliable sources	86	42.8	92	45.8	18	9	2	1	3	1.5	4.27
Total	1290	641.8	2833	414.3	185	92.3	75	37.4	29	14.5	4.36

Table 12
The effective COVID-19 prevention behaviors by cancer patients

The effective COVID-19 prevention behaviors by cancer patients	0.96
Total number	201
P-value	<0.001*

* Significant at 0.05

Discussion

The findings of the study (Table 1) indicated that cancer patients need Information about COVID-19 to know how to treat COVID-19, identify COVID-19 symptoms, know about how COVID-19 is transmitted, identify COVID-19 complications, protect themselves and their family members against COVID-19, find out a healthy diet to boost the immune system against COVID-19 and know about correct techniques to keep on physical activities during COVID-19 outbreak, how to effectively talk to children about COVID-19, to know about COVID-19 mechanism of action, COVID-19 testing, the age groups that are more vulnerable to COVID-19, quarantine/lockdown techniques, and effective doses of medicine to treat COVID-19. The data presented in Table 2 suggest that the information needs of cancer patients to prevent COVID-19 were met satisfactorily as indicated by the Friedman ratio. This is probably because the patients know what foods they need to boost their immune systems. Furthermore, the patients needed Information on the correct techniques for maintaining physical activity during the COVID-19 outbreak of the disease. They also needed Information on how to protect themselves and their family members against the COVID-19 disease.

Moreover, the study results (Table 3) indicate that the correct search techniques to find Information about COVID-19 included simple search on search engines and websites, searching through databases, advanced search, and searching libraries, respectively. The data in Table 4 suggest that the cancer patients used effective information-seeking methods, including simple search (common words that came to their mind), searching databases, and advanced search to find COVID-19 Information. Similarly, Zhao et al. (2018) found that users are more likely to search for COVID-19 Information online.

As can be seen in Table 5, the information sources used frequently by the cancer patients included TV programs, news, physicians and health care professionals, friends, medical brochures, WhatsApp, radio programs, websites of the Iranian Center for Disease Control and the National Center for COVID-10 Control (NCCC), Instagram, scientific articles, specialized databases, colleagues, WHO websites, and newspapers. The study's findings (Table 6) also show that the cancer patients in Kerman had access to relatively adequate COVID-19 information sources. The patients reported watching TV programs to find Information about the COVID-19 disease. In a similar vein, previous studies by Ebrahim et al. (2020), Moreno et al., (2020) and Liu (2020) reported that the mass media, such as television, are the most reliable source of Information. Those dependent on the primary news media to receive COVID-19 Information are generally more likely to express positive attitudes toward the government's communication strategy. After television, news agencies, physicians, and healthcare professionals were most frequently used by cancer patients to receive COVID-19 Information. Similarly, Qian et al. (2020) found that individuals depend highly on healthcare providers for Information and awareness about the disease.

The data in Table 7 indicate the obstacles faced by cancer patients to access COVID-19 Information, including reading or hearing shocking Information, doubtful Information, sharing worrying Information, delayed Information, conflicting Information, the spread of rumors, lack of reliable sources of Information, Confidential Information about COVID-19, the availability of large volumes of data on tumors and cancers, difficulty in understanding scientific materials, and time constraints. The patients reported that reading or hearing shocking Information about COVID-19 made them anxious. After shocking Information, suspicious Information was the main barrier to accessing reliable Information. Following the findings of this study, Ashrafi-rizi and Kazempour (2020) reported shocking Information followed by suspicious Information

is the main obstacle to accessing reliable sources and Information about COVID-19. The present study also showed that worrying about Information was the third main barrier to accessing Information. Accordingly, Salkovskis and Warwick (1986) reported that shocking Information is the main obstacle to accessing reliable sources and Information. This finding was not in line with the results of the previous studies (Ebrahim et al, 2020; Keshavarz, 2015; Norr et al., 2014; ICANotes, 2020; Zarocostas, 2020; Sørensen et al., 2015). The results of this study (Table 8) indicated that cancer patients used COVID-19 Information effectively to identify the symptoms of COVID-19, know about quarantine/lockdown techniques, and treat the COVID-19 disease. Similarly, Ebrahim et al., (2020) reported that patients use the Information to know how to apply proper self-quarantine.

As displayed in Table 11, the most frequent preventive behaviors by cancer patients to protect against COVID-19 disease included regular handwashing with soap and water, wearing masks in public places, staying away from people with flu-like symptoms, disinfecting objects, avoiding travels, staying away from crowded places, keeping the body immune to prevent the disease, avoiding the use of public transportation, applying the Information received from reliable sources about preventive behaviors against the disease, seeking medical advice with the onset of COVID-19 symptoms, not attending school and work, and taking preventive medicine. The findings of the study (Table 12) indicated that the cancer patients engaged in effective COVID-19 prevention behaviors such as regular handwashing are in keeping with findings of Liu (2020); Nazione et al. (2021) and Prem et al. (2020), washing hands with soap and water was the main option for the participants for preventing COVID-19. The data in the present study also indicated that wearing masks in public places and avoiding people with COVID-19 symptoms were the most important options for cancer patients to prevent COVID-19. According to Liu (2020) and Prem et al. (2020), maintaining physical distance is one of the most important COVID-19 prevention options.

Conclusion

The present study results indicated that the information needs of cancer patients in Kerman to prevent COVID-19 were met satisfactorily. The patients knew what foods they needed to eat to boost their immune systems. It was also found that the cancer patients used effective search techniques to find Information to prevent COVID-19. For instance, the patients used simple search (common words that came to their mind) to find their required Information. This study showed that cancer patients had access to adequate COVID-19 information sources, including TV programs.

Furthermore, it was found that cancer patients could effectively overcome obstacles to prevent COVID-19 obstacles. The patients reported reading or hearing shocking Information about COVID-19 made them anxious. Data analysis in this study indicated that cancer patients could effectively use COVID-19 Information mainly to identify COVID-19 symptoms. Finally, it was found that the cancer patients engaged in effective COVID-19 prevention behaviors by washing their hands regularly.

Following the present study results, healthcare officials are recommended to prepare special programs and make them available through various media (TV, radio, brochures, etc.) to the public to raise their awareness about nutrition and protection against COVID-19. Furthermore, science and information specialists can organize reliable and helpful information and instructions and disseminate them in social networks to prevent the spreading of false

Information. Additionally, valid scientific materials can be prepared from domestic and international sources and prevent the release of misinformation. Related officials can take some measures to detect false Information and news and penalize those who publish such Information. Such measures can make information sources more reliable for the public. Physicians can also create unique programs to answer and resolve patients' information ambiguities and provide accurate information while reassuring the audience. Moreover, as people mainly use the Information to identify COVID-19 symptoms and self-quarantine techniques, more comprehensive data and instructions should be available.

Acknowledgment

We want to acknowledge all the people who supported us in writing this paper.

Funding

This research received no specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Conflicts of interest

There are no conflicts of interest.

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