ORIGINAL ARTICLE

The effect of the COVID-19 pandemic on health anxiety and cyberchondria levels of university students

Mehmet A. Kurcer MD[1] | Zeynep Erdogan PhD[2] | Vildan Cakir Kardes MD[3]

[1]Department of Public Health, Faculty of Medicine, Bulent Ecevit University, Zonguldak, Turkey

[2]Nursing Department, Ahmet Erdoğan Vocational School of Health Services, Bulent Ecevit University, Zonguldak, Turkey

[3]Department of Psychiatry, Faculty of Medicine, Bulent Ecevit University, Zonguldak, Turkey

Correspondence

Zeynep Erdogan, Nursing Department, Ahmet Erdoğan Vocatıonal School of Health Services, Bulent Ecevit University, Zonguldak, 67600 Turkey.
Email: zeynerdogan@hotmail.com

Abstract

Objective: Our study hypothesizes that the fear and panic of COVID-19 triggers cyberchondria (CYB) in students thus increasing health anxiety. In this way, we aim to determine the effect of the belief of previously having had and not having had COVID-19 on health anxiety and CYB levels of the university students.

Methods: Our study is a descriptive cross-sectional study. The target population of our study consisted of 950 students who were continuing their education in the Vocational School of Health Services, an associate degree program of a university, and the samples consisted of 794 students (85.5%) who filled out our questionnaire ($n = 794$). The questionnaire form included the information regarding sociodemographic characteristics and the symptoms of COVID-19, and the obtained data were electronically collected altogether with Cyberchondria Scale (CS) and Health Anxiety Inventory.

Findings: Health anxiety mean scores were significantly higher in people who lived alone, had a chronic disease, searched for symptoms online, and took herbal supplements against COVID-19 ($p < 0.05$). The mean total scores of Health Anxiety Inventory, CS, Anxiety-Increasing Factors Subscale of the students who believe they have had COVID-19 were significantly lower compared to the scores of those who believe they have not had COVID-19. Nevertheless, women and people living alone and in cities had significantly high CS scores ($p < 0.05$).

Conclusion: The increase in infodemia can be prevented with the services offered by specialists through mental health helpline or websites to people with high health anxiety or CYB levels, especially to women, and to people living alone and in urban areas.

KEYWORDS

COVID-19, cyberchondria, health anxiety, pandemic, student

1 | INTRODUCTION

Fear is an emotional response of the individual against a potential threat, and it has physiologic and psychologic features. Chronic and unproportioned fear can be harmful and may create a tendency to various psychological problems. During a pandemic, fear increases anxiety and stress levels.[1] History shows that the impacts of the previous pandemics have lasted longer and spread wider than the pandemics themselves.[2] Almost half of the people reported moderate anxiety and one-third of the people severe anxiety.[3] Besides, an increase was reported in infodemia, which was described by the World Health Organization (WHO) as the spread of excessive and false information or news during COVID-19. The increased infodemia caused fear and panic in society and complicated the management of the pandemic, and this led to elevated levels of cyberchondria (CYB).[4,5] CYB is defined as the people's excessive and repetitive search of health information on the Internet with the urge of relieving the health anxiety thus becoming more anxious and fearful as a result.[6]

It is still being investigated to what extent CYB represents a novel, distinct, and autonomous disorder or a common phenomenological sign that exists in several established psychiatric disorders.[7]

People started to seek information online to fulfill their knowledge, entertainment, and communication needs after the development in information and communication technologies and the widespread use of the Internet. They can get through to various health sources and expert opinions easily through the Internet.[8] Internet is a vital source for individuals seeking health information, including new symptoms or diagnoses, treatment choices, and medication.[9,10] Although the Internet has many time-saving and cost-effective benefits for individuals to access information, telemedicine, and online psychotherapy,[11,12] it may also have disadvantages like spreading inconsistent, vague, or false information and it may even harm the doctor-patient relationship.[13] When an online health source is perceived as reliable, it is more likely to trigger health concerns.[14] Regardless of the leading cause of seeking medical information online, the search results may cause the individual to seek more information, thus the person develops more fear and anxiety.[15] In their study, Wang et al.[16] investigated the effect of the COVID-19 pandemic in China on the mental health of the general population and reported that the Internet, TV, radio, and other family members were primary sources of information. And in the same study, the spread of medical information through radio was associated with high levels of anxiety and depression.[3] COVID-19 pandemic also presents a significant worldwide threat. Interpersonal relationships are getting negatively affected not only by the strict measures taken by governments but also by loneliness, the fear of becoming infected, and of dying. Dealing with these fears on an individual level is critical, and the most effective way of coping with them is to support society during the management of the pandemic.[4] Studies carried out on students reported that students with health concerns seek online medical information more frequently and for a longer duration, and these anxious individuals were reported to make more online research for diagnosed or undiagnosed conditions because they were feeling more distressed and more anxious after their research.[14,17]

In the present study, our hypothesis is that the fear and panic caused by the COVID-19 pandemic may trigger CYB levels and increase health anxiety, and we aim to determine the effect of the belief of previously having had and not having had COVID-19 on health anxiety and CYB levels of university students.

2 ┃ METHODS

2.1 ┃ Design, setting, and sample

The population of this cross-sectional study included a total of 940 students who were continuing their education in the Vocational School of Health Services, an associate degree program of a university. The study sample (83.5%) included 794 students who filled out the Cyberchondria Scale (CS), Health Anxiety Inventory, and the questionnaire prepared by the researchers, including sociodemographic characteristics and information on their belief of having previously had COVID-19 infection (n = 794).

Inclusion criteria were as follows: to be over 18 years of age, to accept to participate in the research, and not to have a mental or cognitive disorder. The data was collected online between April 7, 2020 and April 25, 2020.

2.2 ┃ Data collection

In the 2020–2021 Academic Year spring semester, the questionnaire was sent to the students by e-mail for them to fill out at the given dates. Most of the students completed the questionnaire. The data was collected through the CS, Health Anxiety Inventory, and Student Information Form that included the student's sociodemographic data (age, sex, economic situation), the symptoms of COVID-19, the precautions taken against it, and the characteristic of the Internet use.

2.2.1 ┃ Cyberchondria Scale

Developed by Durak-Batigun et al.,[18] the scale consists of 28 items and has five subscales which are Anxiety Increasing Factors, Compulsion/Hypochondria, Anxiety Relieving Factors, Doctor–Patient Relationship, and Dysfunctional Internet Use. The increase in scores of the scales and all the subscores indicates an increase in health information seeking and anxiety thus indicating an increase in CYB levels. The scale does not have a cut-off point. Cronbach's alpha reliability coefficient for CS total score is 0.93.[18] In our study, Cronbach's alpha internal consistency coefficient of the scale was found to be 0.91.

2.2.2 ┃ Health Anxiety Inventory

Developed by Salkovskis et al.,[19] the inventory is a self-report scale with 18 items. The scale is two-dimensional. The range of the scale score is between 0 and 3 for each item, and higher scores indicate higher levels of health anxiety. The reliability and validity study of the Health Anxiety Inventory was carried out by Aydemir et al.[20] Cronbach's alpha internal consistency coefficient of the scale is 0.918. In our study, Cronbach's alpha internal consistency coefficient of the scale was found to be 0.82. Permissions were taken for the use of both scales.

2.3 ┃ Statistical analysis

SPSS software package was used for the evaluation of the data and mean ± SD and percentages (%) were presented. The data was shown to be normally distributed with The Shapiro–Wilk and Kolmogorov–Smirnov tests. Student's t-test and analysis of variance test were used for the analysis of continuous variables.

2.4 ┃ Ethical considerations

Permission was given by the Vocational School of Health Services, and ethical approval was obtained from the Human Research Ethics Committee of a university on April 6, 2020, with approval number 772.

3 | RESULTS

The mean age of the students included in the study was 20.6 ± 2.17 and most of them (75.4%) were female. Of all the students, 22.3% were smoking, 24.6% were consuming alcohol, and 8.2% had at least one chronic disease (Table 1).

The distribution of the students' consulting to doctor, having been tested, and of their contact with an infected person in terms of their symptoms are shown in Table 2. According to Table 2, 29.6% of the students believe that they previously had COVID-19 as they had an illness in 2020 with symptoms, including cough, shortness of breath, fever, and fatigue. Of these students, 66.8% were reported not consulting a doctor, 22.7% were reported to consult a doctor for examination but not having been tested for COVID-19 diagnosis, and only 0.5% were reported to have been tested for COVID-19 and their test results were negative. Of the students, 70.4% reported no COVID-related complaints; however, of these students, 1.4% were tested for COVID-19 due to having had contact with an infected person, and all of them tested positive for COVID-19. So, a total of 10 students were tested for COVID-19 (Table 2).

The mean health anxiety scores of students in terms of sociodemographic data and some variables are shown in Table 3. According to Table 3, the mean Health Anxiety scores of the students are significantly higher in females than in males, in people living alone than in those living with family, friends, and in dormitories, in students with chronic disease than in those without any chronic disease, in students who seek online health information than in those who do not seek online health information and in students who used herbal medicines against COVID-19 in the last 2 months than in those who did not use any herbal medicine ($p < 0.05$). There was no significant difference between the mean Health Anxiety scores and the age and university year of the students, the city that they live in, their smoking, nonsmoking, and alcohol consumption status, the use of unprescribed drugs, and the frequency of handwashing ($p > 0.05$) (Table 3).

Distribution of the CYB scores of the students according to sociodemographic data and some variables are shown in Table 4. CYB scores of the students were significantly higher in females than in males, in students living in urban areas than those living in rural areas, in the students living alone than in those living with their families, friends, and in dormitories ($p < 0.05$). There was no significant difference between mean CYB scores and the age of the students, the frequency of seeking online health information, the presence of chronic disease, the use of unprescribed drugs, their smoking, nonsmoking, and alcohol consumption status, and the use of herbal medicine against COVID-19 in the last 2 months ($p < 0.05$) (Table 4).

The distribution of the mean scores of the Health Anxiety Inventory and CYB subscales of the students in terms of their belief of having previously had COVID-19 are shown in Table 5. According to Table 5, the mean total scores of Health Anxiety Inventory, CS, Anxiety-Increasing Factors Subscale of the students who believe they have had COVID-19 are significantly lower compared to the scores of those who believe they have not had COVID-19 ($p < 0.02$) (Table 5).

4 | DISCUSSION

Health anxiety is the somatic and mental concerns about having a severe illness and is triggered by the perceived bodily changes.[21] Dysfunctional beliefs have an impact on health anxiety. In their study, Salkovskis and Warwick[22] defined four types of dysfunctional beliefs associated with health anxiety: (1) likelihood of experiencing a health problem, (2) awfulness of experiencing a health problem, (3) inability to cope with an experienced health problem, and (4) inadequacy of medical resources to treat an experienced health problem.[22] In a study, the beliefs of "inability to cope with an experienced health problem" and "likelihood of experiencing a health problem" were found to be predictive of health anxiety in a group of individuals without the diagnosis of a physical condition.[23] Similarly, a positive relationship was found between university students without the diagnosis of a physical condition and the beliefs; "likelihood of experiencing a health problem" and "inability to cope with an experienced health problem," and these beliefs were found to be predictive of health anxiety.[24] Higher scores were reported in most of the previous studies evaluating health anxiety in people who were temporarily ill or diagnosed with a severe medical condition.[25,26] However, the definition of COVID-19 as a highly contagious and deadly virus leads to a perception of a high possibility of getting infected and to worse case scenarios in case of being infected. In our study, the participants who believe that they have had COVID-19 (infected, recovered, and moving forward) were already tested regarding their beliefs of "likelihood of experiencing a health problem" and "inability to cope with an experienced health problem" and thus, we think that the anxiety scores of these participants might have been reported lower than those who believe they have not had COVID-19. The unique features of pandemics, such as incubation period, altering clinical pictures, and having no pharmacological interventions, may especially increase health anxiety.[27] Intolerance of uncertainty (IU) is remarkable in studies investigating psychological factors that may be associated with anxiety

TABLE 1 The distribution of the students' sociodemographic data and some variables ($n = 794$)

Sociodemographic data and some variables	n	%
Sex		
Female	598	75.4
Male	196	24.6
Smoking status		
Yes	177	22.3
No	560	70.4
Quitted	57	7.2
Alcohol consumption		
Yes	196	24.6
No	598	75.4
Chronic disease		
Yes	66	8.2
No	728	91.8

TABLE 2 The distribution of the students consulting the doctor, having been tested, and of their contact with an infected person in terms of their symptoms (n = 794)

COVID-19	n	%	Status	n	%
Thinking that they had the infection	225	29.6	No consultation with the doctor	157	66.8
			Consulted doctor, was not tested	76	22.7
			Consulted doctor, was tested[a]	2	0.5
Not thinking that they had the infection	569	70.4	Not in contact with an infected person	551	98.6
			In contact with an infected person[b]	8	1.4

[a]All tested negative.

[b]All tested positive.

during a pandemic. In the literature, IU is related to increasing health anxiety.[28] In this context, the unpredictable clinical picture of COVID-19 and related IU may be associated with high levels of anxiety of the participants who believe they have not had COVID-19 due to their having no experience with the infection.

In our study, the mean Health Anxiety scores of the students were reported to be significantly higher in females than in males, in people living alone than in those living with family, friends, and in dormitories, in students with chronic disease than in those without any chronic disease. In literature, females are more at risk than males regarding the general anxiety forms.[29] Females can be more anxious than males due to many factors, such as biological factors like imbalances in reproductive hormones, sociocultural factors, personality traits like increasing anxiety sensitivity, and cognitive factors like a high tendency to ruminate.[29,30] Likewise, Lim et al.[31] examined the prevalence of depression in 30 different countries between 1994 and 2014 in their meta-analysis and reported the depression level as 14.4%.[31] In a recent study, the possibility of anxiety and depression were found to escalate significantly with younger age, female gender, urban living, pre-existing medical conditions, health status about COVID-19, and concern on COVID-19.[32] Similar to the literature, we also found that health anxiety was higher in females compared to males in our study.

A negative correlation was found between mean Health Anxiety Inventory scores and the number of households in a study carried out on health anxieties of nurses working in a university hospital in Turkey. The number of households and health anxiety were reported to have an inverse relationship.[33] Similarly, we reported a higher rate of health anxiety in students living alone. In addition, no significant difference was found between the health anxiety scores of the students and their accommodation, year, and department in a study carried out in a public university in Turkey.[34] The impact of the pandemic on elevated anxiety levels can also be considered in our study.

In a study conducted in Australia, the participants with at least one physical disorder were found to be 4.6 times more likely to meet health anxiety criteria than those who were relatively healthy.[35] Similarly, we also found that students with chronic disease had higher levels of health anxiety. Also, a study conducted in China on 1590 patients diagnosed with COVID-19 reported that an associated chronic comorbid disease increased COVID-19 infection risk by 1.7 times, and two or more comorbid diseases by 2.5 times.[36] Given the above, the students with a chronic disease included in our study had higher health anxiety during the pandemic, and we believe

the reason for that may be the frequent emphasis of media and specialists on the information on COVID-19.

In our study, Health Anxiety scores of the students who frequently seek online health information were found to be higher than the scores of those who do not seek online health information. This finding shows that patients with health anxiety increasingly treat the Internet as a source of medical information even if there are many other sources of health information out there, such as books and magazines.[37] People who were more concerned about their health were reported to seek online health information more often on a health-related website in Canada.[38] People with indigestion, back pain, irritable bowel syndrome, and somatoform disorders are reported to seek more online health information.[39] Le et al.[40] examined the demand for health information on COVID-19 in Vietnam and reported that individuals mostly sought information on updated data about pandemic and disease symptoms. There is much evidence showing that individuals with higher health anxiety may search for more online health information.[17] According to the cognitive-behavioral model,[41] the cognition which is common in individuals with health anxiety may be regarded as false beliefs about the possibility of having a serious illness and the dangerousness of the uncertainty. Intolerance to uncertainty may also trigger online health-seeking in individuals with health anxiety. Individuals with health anxiety may be different in their health-related Internet use and may have different attitudes toward seeking health information when compared to those without any health anxiety.[42] The fact that individuals who are more health anxious seek online health information more frequently and for longer periods can be approached as part of cognitive-behavioral concept with its controlling and safety-seeking behaviors.[17] Studies support the idea that health anxious individuals find reassurance by examining the relationship between their online health search results and their own symptoms.[41]

In the present study, the Health Anxiety scores of the students who took herbal medication were found to be significantly higher than the scores of those who did not take any herbal medication. They might have experienced higher levels of anxiety during the pandemic and became concerned about catching the illness, and thus they might have sought help from herbal products. The reasons why complementary medicine, such as herbal products are in high demand are the individuals' desire to take control and responsibility of their own treatments, their efforts in diminishing the symptoms, the high cost of current treatments, and their attempt

TABLE 3 The mean health anxiety scores of students in terms of sociodemographic data and some variables ($n = 794$)

Variables	n	Mean ± SD
Age		
Aged 19 and under	218	35.4 ± 7.12
Aged 20 and older	576	35.4 ± 7.07
Sex		
Female	596	**36.2[a] ± 6.82****
Male	198	33.0 ± 7.21
Where they live?		
Rural	172	35.7 ± 7.45
Urban	622	35.3 ± 6.94
The year at university		
Fist	322	35.4 ± 6.64
Second	472	35.1 ± 7.14
The frequency of seeking online health info		
Always/frequently	78	**40.0[b] ± 7.37***
Often	402	36.0 ± 7.25
Rarely	275	33.8 ± 7.52
Never	39	36.0 ± 7.13
Presence of a chronic disease		
Yes	80	**38.0[a] ± 7.38***
No	714	35.1 ± 6.97
Who do they live with?		
Family	660	35.1 ± 7.32
Dormitory	48	35.8 ± 7.32
Alone*	20	**38.5[b] ± 10.44***
Friends*	66	35.9 ± 7.42
I bought medication against COVID-19		
Yes	111	36.2 ± 7.78
No	683	35.1 ± 6.85
Smoking status		
Yes	177	34.9 ± 7.01
No	617	35.3 ± 6.99
Alcohol consumption		
Yes	118	34.6 ± 7.43
No	676	35.6 ± 6.98
I used herbal medicine against COVID-19		
Yes	316	**36.4[b] ± 6.96****
No	478	34.5 ± 7.02
My hand-washing frequency increased due to COVID-19		
Yes	361	35.1 ± 6.74
No	433	

TABLE 3 (Continued)

Variables	n	Mean ± SD
		35.5 ± 7.21

Abbreviation: ANOVA, analysis of variance.
[a]t-Test.
[b]ANOVA test.
*$p < 0.05$.; **$p < 0.0001$.

TABLE 4 The distribution of the CYB scores of the students in terms of sociodemographic data and some variables ($n = 794$)

Variables	n	Mean ± SD
Age		
Aged 19 and under	218	63.0 ± 13.22
Aged 20 and older	576	63.7 ± 14.04
Sex		
Female	596	**64.2[a] ± 07.23***
Male	198	62.0 ± 06.81
Where they live?		
Rural	172	61.6 ± 14.0
Urban	622	**64.1[a] ± 13.76***
The year at university		
First	322	63.9 ± 1.68
Second	472	63.6 ± 13.93
The frequency of seeking online health info		
Always/frequently	68	62.3 ± 13.14
Often	392	63.5 ± 13.14
Rarely	265	63.4 ± 13.14
Never	39	63.8 ± 13.14
Presence of a chronic disease		
Yes	65	63.7 ± 14.03
No	699	62.4 ± 11.41
Who do they live with?		
Family	660	63.56 ± 13.66
Dormitory	48	61.83 ± 13.61
Alone*	20	**70.3[b] ± 17.53-***
Friends*	66	63.56 ± 13.66
I bought medication against COVID-19		
Yes	111	63.7 ± 13.58
No	683	62.7 ± 14.71
Smoking status		
Yes	177	64.5 ± 13.96

TABLE 4 (Continued)

Variables	n	Mean ± SD
No	617	65.5 ± 13.22
Alcohol consumption		
Yes	118	62.4 ± 11.41
No	676	63.7 ± 14.03
I used herbal medicine against COVID-19		
Yes	316	63.31 ± 12.34
No	478	63.82 ± 13.40
My hand-washing frequency increased due to COVID-19		
Yes	346	63.3 ± 14.44
No	419	63.7 ± 13.46

Abbreviations: CYB, cyberchondria; ANOVA, analysis of variance.
[a]t-Test.
[b]ANOVA test.
*$p < 0.05$.; **$p < 0.0001$.

TABLE 5 The distribution of the mean scores of the Health Anxiety Inventory and CYB subscales of the students in terms of their belief of having previously had COVID-19 ($n = 794$)

Scales and subscales	I think I have had COVID-19	Mean	SD
Health Anxiety	Yes	**34.62**[a]*	6.30
	No	35.90	7.47
Dysfunctional Internet Use	Yes	17.95	4.48
	No	17.78	4.84
Compulsion/Hypochondria	Yes	18.04	3.8
	No	18.44	4.0
Anxiety Increasing Factors	Yes	**17.72**[a]*-*	4.5
	No	18.39	4.87
Anxiety Relieving Factors	Yes	14.71	4.30
	No	15.31	4.55
Doctor–Patient Relationship	Yes	11.91	3.23
	No	12.25	3.35
CYB	Yes	**62.39**[a]*-*	13.14
	No	64.40	14.20

Abbreviation: CYB, cyberchondria.
[a]t-Test.
*$p < 0.02$.; **$p < 0.001$

to have better mental health.[43–45] So, the students might have over-consumed these herbal products in order to protect themselves from COVID-19 and not to catch the illness due to infection risk in hospitals.

In this study, the health anxiety and CYB scores of the students living in urban areas and alone were found to be significantly high. In previous outbreaks and pandemics, people living in quarantine were reported to develop feelings of loneliness and anger.[46] In addition, people in quarantine lose their face-to-face communication and traditional social support, thus their stress level increases.[47] Santini et al.[48] pointed out that loneliness and isolation during COVID-19 could trigger anxiety. However, lockdown came into effect for young people both in the world and in our country, and the loneliness and isolation that the lockdown brought has triggered health anxiety, and thus any attempt to get over it created a vicious cycle, so CYB levels increased.[49,50] This finding shows that the young group gets affected by loneliness and isolation as much as old and they need specific psychological and psychiatric health consultation. With this information in hand, psychological interventions against these crises are a part of the health system within the context of public health emergencies.[51]

The finding regarding CYB levels of the students living in urban areas was significantly higher than those living in rural areas might have been due to living alone, being less with family because of the pandemic, not being able to share concerns with someone, having less opportunity for outdoor pastime activities. Therefore, we believe that within the precautions taken by WHO and the Ministry of Health in our country, after the formal education was moved to online and the lockdowns have started, university students have stayed home, and thus their online health-seeking behaviors have escalated.[49,50]

Our study found an increase in CYB scores of females like in health anxiety scores. However, we found no effect of age on the scores. Similar to our study, Laato et al.[52] also found that the ones with high levels of perceived susceptibility to COVID-19 and the female gender had high levels of CYB and found no relationship between age and CYB. In a study by Andreassen et al.,[53] females were found to seek online health information often, which is similar to our results.

In their study, Ivanova[54] evaluated the CYB scores of the participants and found that 33% were seeking information on diagnosed conditions and 26% were searching for information on serious illnesses. Besides, Internet use was found to be related to loneliness and this finding is similar to our results.[54]

Sharing false information in social media is explained by feeling higher levels of trust toward online sources. To solve the problem of false information sharing, it is essential to determine why people are spreading fake news.[55] However, in studies on sharing inaccurate information during a massive health crisis like COVID-19, people were reported to act differently when they were led by fear and anxiety.[56] For instance, there is evidence that online health information seeking during pandemics is more common among people who feel more concerned and fearful.[57] In case social media users encounter a situation that makes them feel frightened or stressed, their Internet use behaviors change, and they experience fatigue due to perceived information overload.[58,59] Laato et al.[52] observed that the two subdimensions of the health belief model; perceived susceptibility and perceived severity, increased both

CYB and unverified information sharing during the COVID-19 pandemic.

4.1 | Implications for nursing practice

As a result of our study, health anxiety scores of females and students who frequently sought online information, had a chronic disease, took herbal medication to protect their health, and lived alone were found to be high, and CYB scores of females and students who lived in urban areas and alone were reported to be high as well. So, to prevent infodemia and the spread of fake news during the pandemic, individuals should be informed by legal arrangements and public service announcements (PSAs). The services of mental health helplines or websites given by experts are recommended to be extended for the groups with high levels of health anxiety and CYB, especially females, people living alone, and those living in urban areas. During the COVID-19 pandemic, online cognitive-behavioral therapy (CBT) was reported to decrease anxiety, stress, and depression levels of the patients with COVID-19 infection and improve their mental health.[60,61] Being a cost-effective method, CBT has also been conducted online and shown to be effective in comorbid depressive symptoms, posttraumatic stress disorder, and insomnia in today's world of widespread Internet use.[12,62] Thus, we can recommend online CBT therapy to the groups with high anxiety and CYB levels in our study.

Also, it is remarkable to see an increase in herbal medication use to support the immune system with the increase in health anxiety. Irrational use of drugs may have adverse effects on liver and renal health. Therefore, PSAs and websites can be created about herbs with a high level of evidence to inform people during this period.

4.2 | Limitations of the study

Although our study provides useful information on health anxiety and the fear of the pandemic, there are many limitations on this field that should be considered for the development of future studies. Participants were young and educated, and it is unknown whether the findings would be generalized among populations with different demographic characteristics or not. The cognitive-behavioral model of health anxiety emphasizes the significance of specific cognitions in understanding health anxiety. In our study, however, some questions regarding the role of the cognitions over health anxiety went unanswered due to the cognitions not having been evaluated. In addition, health anxiety treatment can be investigated to see whether it would be useful in preventing anxiety of health in case a new pandemic emerges. Further research may develop a more extensive, multielemental model of evaluating health conditions among Internet users, and clinical trials may also examine the impact of seeking online health information on health anxious individuals. Observational and qualitative studies may help us to better observe how health anxious Internet users seek health information. It can also be investigated whether health anxiety treatment would be protective in preventing future health anxiety on the

condition that another pandemic occurs. Future studies may improve more comprehensive, multi-item metrics of health-related Internet use. Experimental studies can examine the effect of online health-seeking among those with health concerns, and observational or qualitative studies can provide a better understanding of how people with health concerns use the Internet to seek health-related information.

CONFLICT OF INTERESTS

The authors declare that there are no conflict of interests.

AUTHOR CONTRIBUTIONS

Mehmet A. Kurcer: Literature search, study design, analysis of data, manuscript preparation, review of the manuscript. **Zeynep Erdogan:** Literature search, data collection, study design, analysis of data, manuscript preparation, review of the manuscript. **Vildan Cakir Kardes:** Literature search, manuscript preparation, review of the manuscript.

ORCID

Mehmet A. Kurcer https://orcid.org/0000-0003-2672-1079
Zeynep Erdogan https://orcid.org/0000-0002-7298-7559
Vildan Cakir Kardes https://orcid.org/0000-0002-6417-972X

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