Evaluation of Relationship Between Cyberchondria and Obsessive Beliefs in Adults

Zeynep Demirtas*, Gulsum O. Emiral†, Seval Caliskan‡,
Sevil A. Zencirci‡, Alaettin Unsal‡, Didem Arslantas‡,
Kazim Tirpan¶

Objective: The aim of this study was to evaluate the relationship between cyberchondria and obsessive beliefs and determine the potential risk of the former.

Methods: This was a cross-sectional study conducted with 777 individuals. The Cyberchondria Severity Scale and the Obsessive Beliefs Questionnaire were applied to the participants. Univariate and hierarchical multiple linear regression analyses were used to analyze the data.

Results: Of the study group 382 (49.2%) were male, 395 (50.8%), female. Their ages ranged from 18 to 63 years, with an average of 32.6 (± 9.6) years. Multiple linear regression analysis found that the frequency of internet use (several times a day; n = 670), using the internet as a source of health-related information (n = 320), using the internet to research a doctor before making and/or attending an appointment with same (n = 363), halting the use of prescribed medication based on information obtained on the internet (n = 177), and obsessive beliefs were factors linked to cyberchondria. Cyberchondria and obsessive beliefs were positively related and in the final model were found to be the strongest determinants of cyberchondria.

Conclusion: Obsessive beliefs may be a potential risk factor for cyberchondria. Since cyberchondria affects people's health-related behaviors, it is important to ensure the safety of health-related information on the internet. The results of this study may guide future ones that thoroughly investigate the factors associated with cyberchondria. More comprehensive studies are needed to reveal the relationship between cyberchondria and obsessive beliefs. [_P R Health Sci J 2022;41(4):233-238_]

Key words: Cyberchondria, Obsessive beliefs, Cyberchondria severity scale

Cyberchondria was first proposed as a new disease in 2001 in The Independent, a newspaper published in England (1). Cyberchondria is defined as excessive and repetitive searching for health-related information on the internet to seek reassurance and reduce health anxiety but that instead results in increasing health anxiety. Cyberchondria has been associated terminologically and conceptually with hypochondriasis. It occurs as part of health anxiety and hypochondriasis (2,3).

Developments in modern technology have allowed more individuals than ever before to access the internet, drastically increasing internet usage. It has been reported that approximately 56% of the world's population uses the internet (4). Of the population of Turkey, 73% have been reported to be internet users (5). The Pew Research Center reported that 80% of internet users at least occasionally search online for health-related information. Individuals who use the internet to obtain information about their health often investigate a specific disease, treatment, doctor, or hospital; nutrition is also a frequently searched subject (6).

In India, the prevalence of cyberchondria has been reported to be 55.6%, and in Sri Lanka, 16.3% (7,8). In the United States,

around 35% of adults reported that they use the internet specifically as a diagnostic tool (9). In a study conducted in England, 51% of adults reported using the internet to search for health information (10). According to a study conducted on university students in Turkey with health problems, 14.2% of these students had sought health information via the internet (11).

In a meta-analysis study, cyberchondria was found to be a distinct diagnostic entity associated with anxiety sensitivity, obsessive-compulsive symptoms, health anxiety, and uncertainty intolerance (12). In the study by Schenkel et al., indicators of cyberchondria correlated with being of a relatively older age, having a negative medical history, suffering from health anxiety, and suffering from hypochondria (12).

*Unye Health Directorate, Ordu, Turkey; †Cankaya Health Directorate, Ankara, Turkey; ‡Eskisehir Osmangazi University, Faculty of Medicine, Public Health Department, Eskisehir, Turkey; ¶Kemal Nurhan Mani Family Medicine Unit, Eskisehir, Turkey

Address correspondence to: Spec. Dr. Gulsum Ozturk Emiral, Cankaya Health Directorate, Ankara, Turkey. Email: dr.gulsum.ozturk@gmail.com

Health-related search engines do not distinguish between materials provided by healthcare professionals, those who develop evidence-based medicine, and unreliable sources. Therefore, there are potentially harmful aspects to doing health-related research on the internet as well as those that might be beneficial. In this regard, the source of information is a key element in the search for online health information (13). The health anxiety of individuals who seek information from unofficial and unreliable sources on the internet may increase; they may make the wrong decisions about their health, and the diagnosis and treatment processes may be adversely affected. In addition, the insufficient medical knowledge of individuals may both lead them to misinterpret health-related information and cause negative health outcomes (14–17). Therefore, it is likely that cyberchondria will be one of the major public health problems in the future.

The aim of this study was to evaluate the relationship between cyberchondria and obsessive beliefs and to investigate the factors associated with cyberchondria.

Materials and Methods

This was a cross-sectional study conducted with individuals aged 18 years and over who applied to family health centers (FHCs) in Eskisehir from January through March 2018. Of the provinces in Turkey, Eskisehir ranks 7th in terms of socioeconomic development (18). According to the Turkish Statistical Institute data from 2018, the population of Eskisehir consists of 434,112 males (49.83%) and 437,075 females (50.17%), making a total of 871,187 individuals (19).

There are a total of 73 FHCs in Eskişehir, 55 in the provincial center and 18 in the central districts (20). In our study, each FHC was accepted as a cluster. In the city center, 7 FHCs included in the study were determined by draw. From peripheral districts, 1 FHC was included in the study. A total of 777 internet users aged 18 and over who went to FHCs during the study period and who agreed to participate in the study constituted the study group. The questionnaire forms were completed by the researchers with a face-to-face interview method.

In order to carry out the study, ethical approval was obtained from the Eskişehir Osmangazi University Non-invasive Clinical Research Ethics Committee. In this study, the sample size was calculated to be 384 (the incidence of cyberchondria was 50%, the margin of error was 5%, the confidence interval was 95%). A cluster sampling method was used in our study. In order to prevent homogeneity between clusters, the pattern effect was taken as 2, and the sample doubled in size (n = 768).

For the purpose of this study, a questionnaire was prepared using the literature (21–26). The questionnaire included questions about the sociodemographic characteristics (age, gender, family income, education) of the individuals who would be participating, some factors that may be related to cyberchondria (chronic disease history, frequency of internet use, using the internet as a source of health-related information,

using the internet to research a doctor before making an appointment with same , using alternative medications, using drugs other than those recommended by a physician, halting the use of prescribed medication based on information obtained on the internet), the Cyberchondria Severity Scale (CSS), and the Obsessive Beliefs Questionnaire.

The CSS was used to evaluate the cyberchondria levels of the participants. This measure was developed by McElroy and Shevlin in 2014 and, the validity and reliability study of the measure in Turkish was performed by Uzun and Zencir (22,23). This measure consists of 33 questions that use a 5-point Likert scale. The answers to the questions were classified as follows: the answer "never" received 1 point, "rarely" received 2 points, "sometimes" received 3 points, "usually" received 4 points, and "always" received 5 points. The possible scores for the questionnaire range from 33 to 165; as the scores increase, the severity level of cyberchondria is considered to be increased (23).

In our study, the Obsessive Beliefs Questionnaire was used to evaluate the obsessive-belief levels of the participating individuals. This measure was developed by the Obsessive Compulsive Cognitions Working Group (27). The validity and reliability study of the measure in Turkish was performed by Boysan et al. in 2010 (Cronbach's alpha: .95) (28). The measure consists of 44 questions that use a 7-point Likert scale. The possible scores for the questionnaire range from 44 to 312; as the scores increase, the level of obsessive belief is increased. In our study, a Cronbach's alpha of .94 was obtained for the Obsessive Beliefs Questionnaire.

In the study, income status was evaluated as "high," "middle," or "low," according to the perceptions of the participating individuals.

The evaluation of data was performed by using the IBM SPSS (version 15.0) statistical package program. Frequency, percentage, mean, standard deviation, median, and range (minimum–maximum) were used to evaluate descriptive data. Univariate and hierarchical multiple linear regression analyses were used for the data analysis. As a result of the univariate linear regression conducted with each variable, the variables associated with cyberchondria (P ≤ .05) were included in the multiple linear regression model. Variables found to have a P value greater than .05 in the univariate linear regression analysis were not included in the multiple regression model. The sociodemographic characteristics were evaluated in the first step and internet usage characteristics evaluated in the second step of the multiple linear regression. P values of .05 or less were considered statistically significant

Results

Of the study group, 382 (49.2%) participants were male and 395 (50.8%) were female. Their ages ranged from 18 to 63 years, with an average of 32.6 (±9.6) years. Of the study group, 320 (41.2%) participants reported a source of health-related information as being the internet. The distribution of the study

group according to sociodemographic characteristics and factors that may be related to cyberchondria is given in Table 1.

The scores of the study participants who took the CSS ranged from 33.0 to 150.0, with a median of 79.0 and a mean (±SD) of 77.0 (±19.6).

The univariate linear regression analysis found that the factors associated with cyberchondria were age (β = .-02 [95% CI: -.034, -.006]), education level (β = .018 [95% CI: .007, .03]), chronic disease history (β = -.03 [95% CI: -.007, -.052]), frequency of internet use (β = .04 [95% CI: .055, .027]), using the internet as a source of health-related information (β = .03 [95% CI: .022, .039]), using the internet to research a doctor

Table 1. The distribution of the study group according to sociodemographic characteristics and factors that may be related to cyberchondria.

Sociodemographic characteristic	N (%)
Age	
18–29	323 (41.6)
30–49	401 (51.6)
≤50	53 (6.8)
Gender	
Female	395 (50.8)
Male	382 (49.2)
Education level	
Primary school	25 (3.2)
Secondary school	42 (5.4)
High school	296 (38.1)
University	414 (53.3)
Income level	
High	224 (28.8)
Middle	520 (66.9)
Low	33 (4.3)
Chronic disease history	
Yes	138 (17.8)
No	639 (82.2)
Frequency of internet use	
Several times a day	670 (86.2)
Once a day	70 (9.0)
Several times a week	23 (3.0)
Once a week	11 (1.4)
Once a month	3 (0.4)
Some factors that may be associated with cyberchondria	
Source of information about health	
Health professional	426 (54.8)
Written and/or visual media	31 (4.0)
Internet	320 (41.2)
Using the internet to research a doctor before attending an appointment with same	
No	414 (53.3)
Yes	363 (46.7)
Using alternative medications	
No	535 (68.9)
Yes	242 (31.1)
Using drugs other than physician-recommended ones	
No	482 (62.0)
Yes	295 (38.0)
Halting the use of prescribed medication based on information obtained on the internet	
No	600 (77.2)
Yes	177 (22.8)
Total	777 (100)

before attending an appointment with same (β = .068 [95% CI: .051, .085]), using alternative medication(s) (β = .019 [95% CI: .0, .037]), halting the use of prescribed medication based on information obtained on the internet (β = .076 [95% CI: .056, .096]), and having obsessive beliefs (β = .254 [95% CI: .177, .33]). According to the results of a hierarchical multiple linear regression analysis, factors related to cyberchondria were frequency of internet use (unstandardized β = .028 [95% CI: .015, .042]; SE: .007; standardized β = .136), using the internet as a source of health-related information (unstandardized β = .019 [95% CI: .011, .027]; SE: .004; standardized β = .149), using the internet to research a doctor before attending an appointment with same (unstandardized β = .047 [95% CI: .03, .063]; SE: .008; standardized β = .188), halting the use of prescribed medication based on information obtained on the internet (unstandardized β = .046 [95% CI: .027, .066]; SE: .01; standardized β = .157), and obsessive beliefs (unstandardized β = .198 [95% CI: .127, .269]; SE: .036; standardized β = .178), (F = 25.825; P < .001). The results of the univariate and multiple linear regression analyses demonstrating factors associated with cyberchondria are given in Table 2.

Discussion

The internet has become an important source of health-related information in recent years, and millions of people around the world use the internet to search for such information (29). Cyberchondria is the repetitive search for health-related information on the internet (22); therefore, the frequency of internet use is expected to be related to cyberchondria. In our study, cyberchondria was found to be positively associated with frequency of internet use. There are studies reporting similar results in the literature (30,31). In a study from Elciyar et al., it was reported that there was no relationship between cyberchondria and the duration of internet use (32).

As a result of searching for online health-related information, an increase or decrease in an individual's anxiety level may be seen. Individuals with increased anxiety are also likely to avoid seeking information on the internet that would increase their anxiety, or they are seeking more confidence by searching more. With the individual's unsuccessful attempts to reduce anxiety, cyberchondria may develop as a result of the recurring information searches on the internet and the vicious circle that such repetition represents (2). In our study, using the internet as a source of health-related information was found to be one of the factors related to cyberchondria. In the literature, there are studies reporting that people have more general anxiety and distress and increased health-related anxiety after seeking health-related information on the internet (31,33). When a person searches for a specific complaint on the internet, that individual may find descriptions of many diseases. Because his/her medical knowledge is insufficient, he/she might evaluate his/her symptoms incorrectly and the bad results he/she might encounter on a given internet search may increase that

person's anxiety. In our study, it was thought that people who reported that their health-related information sources were health professionals (presumably so they could get accurate and reliable information about their complaints) might have less anxiety than those who get this information on the internet.

On the internet, people can make comments about doctors and recommend doctors to each other. This may affect a person's decision-making process in terms of choosing a doctor. In the study group, it was found that before consulting a doctor, investigating said doctor on the internet was associated with cyberchondria. Cyberchondria is a multi-dimensional concept and one of its sub-dimensions is mistrust of health professionals (22). Since individuals with a tendency to cyberchondria are concerned that a physician may be inadequate, it is possible to conduct research on the internet about the doctor they will consult before consulting, and to evaluate the comments of the patients who have visited the same doctor before.

Patients doing this kind of "research" might obtain incorrect or out-of-date information about their disease from the internet or misinterpret the information they receive. This may lead to adverse health outcomes, such as improper treatment, side effects, and untreated disease (34–36). In our study, halting the use of prescribed medication based on information obtained on the internet was found to be associated with cyberchondria. It should be taken into account that cyberchondria can affect the health decisions and treatment of the individuals who suffer from it and may lead to inaccurate medical practices and serious health consequences.

According to the results of the hierarchical multiple linear regression, there was no relationship between age, gender, income level, education level or chronic disease history and cyberchondria. Some studies have reported that there is no relationship between cyberchondria and age or gender (32,37). However, there are also studies reporting that age and gender are linked to cyberchondria (38,39). In our study, as a result of the univariate linear regression, a significant relationship was found between age, education level, and chronic disease history and cyberchondria, whereas this relationship lost its significance when explored using multiple linear regression. This finding suggests that the internet-use characteristics of individuals are more important determinants of cyberchondria than are their sociodemographic characteristics.

Previous studies have shown a potential relationship between the symptoms of obsessive-compulsive disorder (OCD) and cyberchondria. In a study by Norr et al., it was reported

that cyberchondria may play a role in the development and maintenance of OCD symptoms by acting as a safety behavior (24). In a study by Fergus et al., it was reported that there was a positive correlation between cyberchondria and obsessive-compulsive symptoms, but in the regression analysis, it was reported that cyberchondria was not associated with these symptoms (25). Obsessive beliefs are a key factor in the cognitive theories of OCD (40). As a result of the hierarchical multiple linear regression performed in our study, cyberchondria and obsessive beliefs were found to be positively related, and obsessive beliefs were found to be the strongest determinant of cyberchondria in the latest model. It was thought that the intolerance of uncertainty and danger expectation, which is one of the components of obsessive beliefs, could contribute to the continuation of repetitive excessive internet searches in cyberchondria. Another of Norr et al.'s studies also showed that the intolerance of uncertainty plays a potential role in the development of cyberchondria (41), and this result supports our study's findings.

The limitations of our study are that it was a cross-sectional study: Participants did not undergo clinical evaluation. There are a limited number of studies in the literature investigating the relationship between cyberchondria and obsessive beliefs. Moreover, revealing this relationship with multivariate analysis was an advantage of our study. This study has shown that obsessive beliefs may play a potential role as a risk factor for cyberchondria. The tendency towards cyberchondria that some individuals with obsessive beliefs might possess should be further explored. In our study, as the result of relationship between halting the use of prescribed medication based on information obtained on the internet, and cyberchondria, it shows that cyberchondria may affect the health behaviors of individuals. For this reason, ensuring the reliability of health-

Table 2. Results of univariate and multivariate linear regression analysis demonstrating factors related with cyberchondria.

	Univariate analysis β (95% CI)	Model 1 β (95% CI)	Model 2 β (95% CI)
Obsessive beliefs	0.254 (.177, .33)***	0.244 (.167, .32)***	0.198 (.127, .269)***
Age	-.02 (-.034, -.006)**	-0.012 (-.027, -.002)	
Education level	.018 (.007, .03)**	.013 (.001, .024)*	.01 (.0, .021)
Chronic disease history	-.03 (-.007, -.052)*	-.024 (-.046, -.001)*	-.02 (-.04, .0)
Frequency of internet use	.04 (.055, .027)***		.028 (.015, .042)***
Source of information about health	.03 (.022, .039)***		.019 (.011, .027)***
Using the internet to research a doctor before attending an appointment with same	.068 (.051, .085)***		.047 (.03, .063)***
Using alternative medications	.019 (.0, .037)*		.014 (-.003, .032)
Halting the use of prescribed medication based on information obtained on the internet	.076 (.056, .096)***		.046 (.027, .066)***
R^2		0.071	14.697***
F		0.212	25.825***

*$P \leq .05$ **$P \leq .01$ ***$P \leq .001$

related information on the internet is very important in terms of protecting the health of individuals. More comprehensive studies are needed to reveal the relationship between cyberchondria and obsessive beliefs and investigate the factors associated with cyberchondria.

Resumen

Objetivo: El objetivo de este estudio fue evaluar la relación entre la cibercondría y las creencias obsesivas, e investigar el riesgo potencial. Método: El estudio es un estudio transversal realizado en 777 personas que postularon a los centros de salud familiar en Eskişehir. A los participantes se les aplicó un cuestionario que incluía características sociodemográficas, algunos factores relacionados con la cibercondría, Escala de Severidad de Cibercondrías e Inventario de Creencias Obsesivas. Se utilizaron análisis de regresión lineal simple y múltiple para analizar los datos. Resultados: Quienes integran el grupo de trabajo 382 (49.2%) son hombres y 395 (50.8%) son mujeres. Sus edades oscilaron entre 18 y 63 años, con una media de 32.6 ± 9.6 años. Como resultado de la regresión lineal múltiple jerárquica, se encontraron la frecuencia de uso de internet (varias veces al día, n = 670) (β(CI%95):0.028(0.015-0.042), SE:0.007, p<0.001), internet como fuente de información sobre la salud (n = 320) (β(CI%95):0.019(0.011-0.027), SE: 0.004, p<0.001), realizar investigaciones en internet sobre el médico a consultar (n = 363) (β(CI%95):0.047(0.03-0.063), SE:0.008, p<.001), abandonar el medicamento recetado por el médico con la información obtenida de internet (n = 177) (β(CI%95):0.046 (0.027-0.066), SE:0.01, p<0.001), y las creencias obsesivas se encontraron como factores que afectan a la cibercondría (F: 23.825; p <.001). La cibercondría y las creencias obsesivas se correlacionaron positivamente, y se encontró que las creencias obsesivas eran el predictor más fuerte de cibercondrías en el último modelo. Conclusión: Las creencias obsesivas pueden desempeñar un papel como factores de riesgo potenciales para las cibercondrías. Dado que la cibercondría afecta el comportamiento relacionado con la salud de las personas, es importante garantizar la confiabilidad de la información relacionada con la salud en Internet. Los resultados del estudio pueden ser una guía para futuras investigaciones con el fin de investigar de manera integral los factores asociados con la cibercondría. Se necesitan estudios más completos para revelar la relación entre la cibercondría y las creencias obsesivas.

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