Cyberchondria: Affecting and Reducing Factors

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Article History	Abstract
  	Aim: The term "cyberchondria" refers to the escalation of health anxiety resulting from repeated online searches for medical information. Identifying the factors that influence cyberchondria may contribute to address its negative impact on the healthcare system and to develop strategies for reducing health-related anxiety in individuals. Therefore, this study aims to examine the severity of cyberchondria and its association with related factors among adult individuals attending the family medicine outpatient clinics of a university. **Method:** This cross-sectional, analytical study was conducted in a six-month-period, involving volunteer participants aged 18 and above who visited the Family Medicine Outpatient Clinics of Aydın Adnan Menderes University Faculty of Medicine. Data were collected via a 44-item-questionnaire covering sociodemographic features, medical history, number of hospital visits, communication characteristics with the doctor, and internet and social media use duration, as well as the 12-item Cyberchondria Severity Scale Short Form (CSS-12). Statistical analyses were performed using the SPSS 25.0 software package. **Results:** The study was completed with 323 participants who fulfilled the inclusion criteria. The participants had a mean age of 39.8±14.2 years (18-72). Significant correlations were found between participants' CSS-12 scores and certain demographic and behavioral characteristics. Those who rated their health status as poor, those who visited healthcare facilities more frequently, and those who were unable to communicate adequately with their physicians were found to have higher levels of cyberchondria. Additionally, those who believed that they had an undiagnosed illness and those who requested tests without consulting a physician were found to have statistically significantly higher levels of cyberchondria ($p<0.05$). **Conclusion:** Cyberchondria is a multifaceted public health issue that affects both individual health behaviors and healthcare utilization.Addressing this condition requires comprehensive strategies that enhance digital health literacy, reduce health-related anxiety, and strengthen physician-patient communication. These findings contribute to the development of national-level preventive health policies, particularly for high-risk populations, and highlight the essential role of primary healthcare services in managing this issue. **Keywords:** Cyberchondria, health anxiety, online health information search.

INTRODUCTION

The internet has surpassed traditional information sources such as social network, mass media, and even healthcare professionals, becoming a primary channel for accessing health information. Among the various tools available, search engines like Google, Yahoo, and Bing are especially popular for seeking medical advice and health-related data (1).

The accessibility and cost-effectiveness of online health information contribute to several benefits, including increased awareness of health conditions, treatment options, and healthy living recommendations. Moreover, individuals are increasingly showing inclination to make decisions regarding their own health. However, these benefits are accompanied by significant risks. The health information accessed online may be incomplete, inaccurate, or outdated. Relying on such content without professional guidance can lead to misinformed decisions and may strain the physician-patient relationship (2).

Baumgartner and Hartmann suggest that increased health anxiety prompts individuals to frequently consult the internet, intensifying their efforts to obtain health-related information (3). This behavior has contributed to the growing recognition of a phenomenon known as *cyberchondria* (4). Cyberchondria can be defined as the digital-era manifestation of hypochondriasis. It refers to a state of health-related anxiety resulting from the misinterpretation of bodily symptoms and the belief in having a serious illness, often exacerbated by excessive online searches (5). The term *cyberchondriasis*, a combination of "cyber" and "hypochondrias is", was introduced to describe the negative psychological effects of repeated online searches for medical information (6). According to White and Horvitz, cyberchondria involves intense worry triggered by ambiguous or non-verified information about common symptoms found online (7). Starcevic and Berle further define cyberchondria as compulsive or repeated internet use aimed at reducing health-related stress or anxiety (8).

Individuals who experience anxiety due to online health information may seek unnecessary medical consultations, leading to increased healthcare expenditures and inefficient use of resources. These consequences not only burden the healthcare system but may also negatively affect national economies (8). Therefore, identifying the factors influencing cyberchondria is essential to mitigating its impact on both individuals and the healthcare system. Understanding these determinants may help formulate preventive strategies aimed at reducing health-related anxiety and promoting rational health behavior. For this reason, the present study was designed to assess the severity of cyberchondria and to identify contributing factors among individuals attending the outpatient clinics of our department. The findings are also expected to enhance awareness of this phenomenon and provide preliminary data for future studies and public health interventions.

MATERIALS AND METHOD

This analytical, cross-sectional study aimed to assess the prevalence of cyberchondria and its related factors among individuals attending our outpatient clinics. The study sample consisted of adult internet users, aged 18 and above, who visited the clinics within a six-month period and voluntarily agreed to participate after being informed about the research.

Data were collected using a structured questionnaire developed by the researchers based on a literature review, and the Short Form of the Cyberchondria Severity Scale (CSS-12). The questionnaire consisted of two sections: Sociodemographic Information and the CSS-12. The first section included 44 open- and closed-ended questions about participants' sociodemographic features, medical history, frequency of hospital visits, internet and social media use, and trust in health information sources. The answers given to open-ended questions were categorized for the statistical analyses.

The Cyberchondria Severity Scale–Short Form (CSS-12), originally developed by McElroy and Shevlin, is a tool used to measure the tendency for excessive online health information seeking behavior associated with anxiety. The revised short version includes 12 items rated on a 5-point Likert scale (1=Never, 5=Always) and is divided into four sub dimensions: Compulsion (items 2, 7, 10), Distress (items 4, 8, 9), Excessiveness (items 1, 3, 6), and Reassurance Seeking (items 5, 11, 12). The total score ranges from 12 to 60, with higher scores indicating a higher level of cyberchondria.

All statistical analyses were performed using IBM SPSS Statistics version 25.0. Continuous variables were expressed as mean±standard deviation (SD), while categorical variables were presented as frequency (n) and percentage (%). Relationships between CSS-12 scores and continuous variables were examined using Pearson correlation analysis. To determine the predictive factors of cyberchondria severity, multiple linear regression analysis was conducted. A p-value of <0.05 was considered statistically significant.

RESULTS

The ages of the participants ranged from 18 to 72 years, with a mean age of 39.8±14.2 years. Among the participants, 63.2% (n=204) were under the age of 45. In terms of gender, 59.8% (n=193) were female. Regarding education level, a majority of the participants (68.1%, n=220) had received twelve or more years of formal education and with 63.2% of the total (n=204) were actively employed. Of the total, 39.0% (n=126) reported a salary more than $1,300 USD per month. Approximately three-quarters (76.5%, n=247) resided in urban areas.

A total of 32.2% (n=104) of participants reported having at least one diagnosed chronic illness, while 67.8% (n=219) did not report any. The prevalence of diagnosed psychiatric disorders was 13.6% (n=44), with depression being present in 38.6% (n=17) of these individuals.

Approximately half of the participants (54.5%, n=176) rated their health as good.

Table 1 presents the comparison of cyberchondria severity scores according to sociodemographic variables. No significance was observed among age groups (p>0.05). Although women had higher cyberchondria severity scores compared to men, the difference was not statistically significant (p=0.054). The presence of a diagnosed psychiatric disorder significantly impacted cyberchondria severity; those with psychiatric conditions had significantly higher scores than those without a diagnosis (p=0.028). Perceived health status also had a significant association; individuals who rated their health as "poor" reported higher cyberchondria severity (p=0.007).

Table 1. Cyberchondria Severity Scores According to Sociodemographic Variables

Variables		n	CSS-12 (Mean±SD)	p
Age	<45 years	204	27.7±8.5	0.279
	≥45 years	119	26.6±9.6	
Gender	Female	193	28.1±8.9	0.054
	Male	130	26.2±8.8	
Psychiatric Diagnosis	Yes	44	30.1±9.7	**0.028**
	No	279	26.9±8.7	
Self-Rated Health Status	Poor	111	29.2±8.7	**0.007**
	Good	212	26.4±8.9	

Table 2 summarizes cyberchondria severity scores according to healthcare utilization and internet behavior. Individuals who visited healthcare institutions fewer than 10 times in the past year had significantly lower cyberchondria severity scores (p=0.003).

Participants who were uncomfortable while asking their doctors health-related questions scored significantly higher in cyberchondria severity (p=0.025). Those who believed they had an undiagnosed illness had significantly higher cyberchondria severity scores (p<0.001). Requesting medical tests without a physician's recommendation was also significantly associated with higher cyberchondria scores (p<0.001).

Participants who did not believe the internet contributed to their health improvement had significantly lower cyberchondria severity scores (p<0.001). Use of the internet or social media when selecting a hospital or physician was also significantly associated with higher cyberchondria severity scores (p<0.001). Moreover, individuals who conducted online research about their symptoms, before or after consulting a doctor, had significantly higher cyberchondria severity scores (p<0.001).

Table 2. Cyberchondria Severity Scores

Variables		n	CSS-12 (Mean±SD)	p
Number of Healthcare Visits in the Past Year	0-10 visits	275	26.6±8.6	**0.001**
	>10 visits	48	31.4±9.8	
Comfort in Asking Doctor Questions About Health	Yes	256	26.6±8.1	**0.025**
	No	67	29.9±11.1	
Belief in Having an Undiagnosed Illness	Yes	55	31.5±7.8	**<0.001**
	No	268	26.5±8.9	
Requesting Medical Tests Without Doctor's Recommendation	Yes	100	30.1±7.8	**<0.001**
	No	223	26.1±9.1	
Belief in Internet's Contribution to Health Improvement	Yes	226	29.3±8.7	**<0.001**
	No	97	22.7±7.6	
Use of Internet or Social Media for Hospital/Doctor Selection	Yes	216	29.4±8.6	**<0.001**
	No	107	23.1±7.9	
Online Search About Symptoms Before/After Visiting a	Yes	234	29.7±8.2	**<0.001**

| Doctor | | No | 89 | 21.2±7.6 | |

DISCUSSION

The average cyberchondria severity scores observed in this study suggest a moderate level of cyberchondria among the surveyed population. Higher severity levels were identified among participants who perceived their health as poor, visited healthcare institutions more frequently, reported discomfort in asking their physicians health-related questions, belief of an undiagnosed illnesses, requested diagnostic tests without medical advice, belief of the internet' contribution to health improvement, using online sources when selecting healthcare providers, and online searching symptoms before or after visiting a physician.

No association seemed between age and cyberchondria severity scores. Consistent with our findings, a study investigating e-health literacy and cyberchondria levels also reported no age-related differences (9). While Fergus and Dolan noted that younger individuals tend to score higher due to their more active internet use, Norr et al. observed increasing health anxiety with age but decreasing cyberchondria levels (10, 11). These divergent results may reflect the influence of factors such as digital literacy, internet use patterns, and individual health concerns.

In our study, although cyberchondria severity seemed to be higher among female participants, this difference has no statistical significance. Similar to our findings, numerous studies in the literature have reported no association between gender and the level of cyberchondria (12-16). While some studies have indicated higher levels of cyberchondria among female participants, others have found elevated levels among males (17-20). These inconsistent findings regarding the relationship between gender and cyberchondria may be attributed to individual differences influenced by cultural, psychological, and socioeconomic factors.

Participants diagnosed with psychiatric disorders exhibited significantly higher cyberchondria severity scores compared to those without such diagnoses. This finding aligns with studies indicating that psychiatric conditions, particularly anxiety-related disorders, increase online health-seeking behavior (8, 21). Higher anxiety levels and reduced tolerance for uncertainty among individuals with psychiatric conditions may exacerbate cyberchondriac tendencies.

Participants who rated their health as "very good" or "good" had significantly lower cyberchondria scores compared to others. This finding is consistent with research by Norr et al (11). However, other studies reported no association between perceived health status and cyberchondria severity (22, 23). Positive self-perception of health may reduce health-related anxiety and thereby lower cyberchondria severity.

The number of healthcare visits made by participants or their relatives within the past year was positively associated with cyberchondria severity. This finding is concordant with another study that reported that individuals visiting physicians moderately (3–5 times) or frequently (>5 times) had higher cyberchondria levels (24). Similarly, Özyurt et al. found elevated cyberchondria scores among those who visited doctors three or more times annually (25). However, some studies did not find a significance (20, 26). Frequent healthcare utilization may reflect not only physical health needs but also heightened health anxiety and increased online health information-seeking behavior.

Participants who were uncomfortable while asking their doctors about health matters exhibited significantly higher cyberchondria severity scores. This is concordant with the literature suggesting that difficulties in obtaining accurate medical information often lead individuals to search for health information online, potentially increasing anxiety (8, 21). Brown et al. similarly reported that individuals who hesitated to ask physicians questions, or found their answers inadequate, had higher cyberchondria levels (27). A lack of communication may push patients toward unverified online resources, exacerbating cyberchondriac behaviors.

In our study, those who believed they had an undiagnosed illness had significantly higher levels of cyberchondria. This finding suggests that perceived uncertainty regarding one's health status may serve as a triggering factor for cyberchondria. In two separate studies, individuals without a formal diagnosis but with low tolerance for uncertainty were shown to interpret their symptoms as indicators of serious illness, leading to repetitive, anxiety-driven online health information-seeking behavior (28, 29). According to Starcevic, when individuals do not receive clear explanations from physicians, they may become more convinced that they are ill, which can result in compulsive online symptom searching and catastrophic thinking (30). Limited consultation times during medical visits may prevent healthcare professionals from adequately addressing unexplained symptoms, potentially reinforcing misinformation and encouraging cyberchondriac behaviors.

Individuals who requested diagnostic tests without a physician's recommendation were found to have significantly higher levels of cyberchondria severity

compared to those who did not. This finding is supported by data from several studies (6, 16, 22, 31). One study reported a positive relationship between health anxiety and cyberchondria, indicating that as health anxiety increases, individuals are more likely to engage in self-directed medical behaviors (32). This tendency may stem from interpreting online health information in a way that leads them to believe they have a serious illness, as a means to alleviate their health-related concerns.

Participants who believed that the internet contributed to the improvement or enhancement of their health were found to have significantly higher cyberchondria severity scores. Most studies in the literature are consistent with our findings (6, 33-35). These individuals may exhibit higher levels of cyberchondria due to their tendency to engage in repetitive online searches and rely on uncertain or inaccurate health information found on the internet. Similarly, participants who used the internet or social media when choosing a hospital or physician had significantly higher cyberchondria severity scores compared to those who did not. This result aligns with other studies (36-38). This may be attributed to heightened health anxiety and a perceived need for control in the face of information overload and uncertainty encountered online.

Finally, conducting online searches related to symptoms either before or after a medical consultation was also associated with significantly higher cyberchondria scores. This association has also been reported in the literature (8, 39). The vast and uncontrolled range of online medical information can lead users to associate mild or common symptoms with serious diseases, resulting in unnecessary worry and increased anxiety.

CONCLUSION

In conclusion, cyberchondria represents a multidimensional public health issue that can directly influence individual health behaviors and healthcare utilization. Addressing this problem requires a holistic approach integrating education, communication, and policy interventions aimed at enhancing digital health literacy, reducing health-related anxiety, and strengthening physician-patient communication. The findings of this study provide valuable insights for developing national-level preventive strategies, particularly targeting high-risk individuals.

The results not only highlight the multifactorial nature of cyberchondria but also emphasize the pivotal role of primary healthcare services in the early identification and management of individuals' online health information-seeking behaviors and associated anxieties. This study offers a valuable framework for primary care professionals to provide timely guidance and appropriate interventions. Furthermore, the findings make a significant contribution

to preventive medicine and highlight the need for targeted strategies within primary healthcare services to effectively manage and reduce the population-level impact of cyberchondria.

CONFLICTS OF INTEREST
No conflict of interest was declared by the author

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