



## Original Article

# The effect of cyberchondria status and severity on pre-operative patient readiness

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### Abstract

**Objectives:** The study was aimed to determine the effect of the cyberchondria status and severity of the patients on their readiness for surgery.

**Methods:** In this cross-sectional study, 375 patients who received care in the surgical wards of a university hospital between February 10 and April 30, 2023, were included. Data were collected using the Cyberchondria Scale (CS), Cyberchondria Severity Scale (CSS), and the Pre-operative Assessment of Readiness Tool (PART). Data were evaluated by Mann–Whitney U test, t-test, one-way ANOVA, Mann–Kruskal Wallis, and linear regression analysis.

**Results:** The mean age of the patients was 38.0±9.7 years, and 54.1% were female. 59.2% of the patients stated that they spent more than 4 h on the Internet. The mean scores of the patients were 82.7±7.1 for the PART, 72.0±17.5 for the CS, and 33.0±8.6 for the CSS. Cyberchondria status was positively affected ( $p=0.026$ ), and the severity of cyberchondria negatively affected pre-operative patient readiness. Doctor–patient interaction and dysfunctional Internet use positively affect readiness for surgery. Excessiveness had a negative effect, and distress had a positive effect ( $p<0.05$ ).

**Conclusion:** In patients who will undergo surgery, it was determined that readiness for surgery was high and cyberchondria status had a positive effect, while cyberchondria severity had a negative effect.

**Keywords:** Anxiety; health literacy; Internet addiction disorder; nursing; pre-operative period; psychology.

In today's world, the Internet has become a significant and valuable resource, making it easier for people to conduct research and acquire information.<sup>[1]</sup> One of the recent widespread uses of the Internet is searching for medical information related to health issues.<sup>[2,3]</sup> Through these searches, individuals can easily access content created by public, commercial, and other content producers and people with similar health problems.<sup>[3-5]</sup> This behavior offers several advantages for individuals, such as making informed decisions about their health and improving their behaviors for their health.<sup>[3]</sup> Conversely, the fact that not all of the acquired information is verified and conveyed with expert opinions leads to increased stress levels, delayed doctor visits, questioning of the medical competence of health-care professionals, or non-adherence

to prescribed treatments.<sup>[5,6]</sup> One of the most significant disadvantages is the generation of anxiety due to misleading information.<sup>[7]</sup> The intensification of individuals' anxieties as they go-over for knowledge on their health conditions on the Internet, seeking reassurance during times of illness, is referred to as cyberchondria.<sup>[5,8]</sup> In another definition, it is the frequent or over and over again use of the Internet to diminish stress or anxiety related to health.<sup>[9,10]</sup> The prevalence of cyberchondria varies according to studies and the population. In a study investigating the differences in the level of cyberchondria between generations, the level of cyberchondria was found to be high in people who were in Generation Z, male gender, low level of education, unemployed, long Internet usage time, use of social media, good health, and being diagnosed with a se-

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rious disease.<sup>[11]</sup> Individuals with cyberchondria exhibit compulsive behaviors such as excessive online health information searching, thinking the situation is serious, and imagining the worst-case scenario.<sup>[12]</sup> Although this behavior provides temporary relief in reducing anxiety, it can result in a cycle of repetition and lead the individual to experience even more severe anxiety.<sup>[10,13]</sup> In addition to anxiety, cyberchondria can have other consequences. These may include depression, difficulty, and apathy in daily life, a decrease in quality of life, deterioration of mental health, deterioration in social relations, attention problems, a decrease in academic performance, frequent seeking of medical help, and aimless use of resources.<sup>[14-16]</sup> In Türkiye, patients turn to Internet search behavior for various reasons, including economic concerns and disruptions in accessing health-care services.<sup>[4]</sup> The reasons for patients conducting online research about their illnesses can vary from person to person. It is rooted in the belief that it will be beneficial.<sup>[18]</sup> Some patients may search online because of anxiety about their illness, while others may experience anxiety as a result of the information they find online.<sup>[17,18]</sup> There are both positive and negative contributions of online information-going over behavior to the disease process.<sup>[4]</sup> Websites containing incorrect information can increase individuals' stress levels and lead to undesirable outcomes. Especially when individuals have a limited ability to synthesize information, it can lead to anxiety and incorrect decision-making regarding their health.<sup>[19]</sup> These anxieties may prompt individuals to cope on their own or seek advice from a health-care professional.

Surgical readiness is defined as the readiness perceived by the patient before surgery, including a sense of trust and feeling prepared for the procedure.<sup>[20]</sup> Being ready for surgery involves not only physical but also cognitive, emotional, and behavioral dimensions.<sup>[21]</sup> Surgical preparation, in opposition to being prepared, pays attention to patients' perceptions and needs.<sup>[20]</sup> The individual's state of readiness for surgery will positively improve the quality of care and the outcomes of the surgical experience.<sup>[22]</sup> Inadequate surgical preparation can undermine the patient's assurance in the surgery, increase post-operative complications, prolong the recovery period, and lead to decreased satisfaction.<sup>[23]</sup>

Cyberchondria is not recognized as an official diagnosis in the Diagnostic and Statistical Manual of Mental Disorders-5 or the International Classification of Diseases-11. Research on cyberchondria is still ongoing, and more studies are needed to determine its diagnostic validity.<sup>[15,24]</sup> Identifying cyberchondria is often overlooked, as the repetitive information-seeking behavior associated with cyberchondria is expected to increase with the increase in internet use.<sup>[17]</sup> Additionally, there is a lack of literature studies on the level of cyberchondria among patients undergoing surgery.

### Aim

Surgery causes anxiety in patients, and high levels of anxiety may have a negative impact on pre-operative patient readiness. One of the factors that increase pre-operative anxiety

#### What is presently known on this subject?

- Cyberchondria is defined as the exacerbation of anxiety when individuals research their illness on the internet.
- Cyberchondria can negatively affect treatment, care, and communication with health professionals.
- Determination of cyberchondria in clinics is not very common, but it is an overlooked condition.

#### What does this article add to the existing knowledge?

- Patients' readiness for surgery was high
- Cyberchondria had a positive effect on readiness for surgery, whereas cyberchondria severity had a negative effect.
- Although cyberchondria harms the doctor-patient interaction as stated in the literature, it has been seen that it has a positive effect.

#### What are the implications for practice?

- Hospital websites should be made more informative so that patients can scan from the right sources.
- Detailed information on the Internet during the preparation process for the surgery will reduce anxiety and increase readiness.
- Nurses should take part in the preparation, use, and evaluation of information processes where patients can obtain accurate information on the Internet.

may be due to the information obtained as a result of internet searches.<sup>[22]</sup> This condition, called cyberchondria, may increase the patient's pre-operative anxiety and negatively affect the pre-operative patient's readiness. In this direction, the study aimed to determine the interrelationship between cyberchondria status and severity and pre-operative patient readiness among patients undergoing surgery.

### Research Questions

- Does the cyberchondria status of patients in surgical clinics affect pre-operative patient readiness?
- Does the cyberchondria severity of patients in surgical clinics affect pre-operative patient readiness?

## Materials and Method

### Type and Design

This study was a cross-sectional study.

### Place and Date

The study was conducted in the surgical wards of a health application and research center between February 10 and April 30, 2023.

### Population and Sample

Patients who received care between the specified dates, volunteered to participate in the sampling study, were literate, were older than 18 years, used the Internet, would undergo elective surgery, and had not received a psychiatric-specific diagnosis within the past 6 months were included in the study. Nearly 40% of those who went looking for information about health problems on the Internet reported that their health anxiety increased as a result of their search behavior.<sup>[9]</sup> In the sample analysis, calculations were made based on people (40%) who searched for knowledge about health problems on

the Internet and developed health anxiety. In this context, the inclusion of 369 people in the sample was calculated when the incidence was taken at 40% with a 95% confidence interval and a 5% error margin. 375 people were included in the study because there may be incomplete data.

## Data Collection Tools

### Sociodemographic and Clinical Characteristics Form

This form includes variables such as age, educational, occupational, and marital status, gender, social security status, whether or not he or she has had previous surgery, medical diagnosis, ward, length of stay, chronic diseases, devices he or she uses the Internet, and time spent on the Internet.

### Cyberchondria Scale (CS)

It was developed by Durak Batigün et al.<sup>[4]</sup> (2018) to measure the state of cyberchondria. The scale is in a 5-point Likert structure and consists of 27 items and five subdimensions: Factors Increasing Anxiety, Doctor–Patient Interaction, Compulsion/Hypochondria, Dysfunctional Internet Use, and Factors Decreasing Anxiety. There are no reverse-scored items. The score that can be obtained from the scale is 27–135 points. Factors increasing anxiety include increased anxiety due to reasons such as page layout, information content, and the use of medical language in the information searched on the internet. Doctor–patient interaction is the desire to discuss the information obtained on the Internet with the doctor. The compulsion or hypochondria is that internet searches do not last long enough to affect daily life. Dysfunctional Internet use is the use of the Internet in the form of making serious diagnoses as a result of the information obtained from the Internet. Factors decreasing anxiety include the calming of anxiety by thinking that the information obtained is reliable. An increase in the scores obtained from all subdimensions and the whole scale means an increase in the cyberchondria level. The Cronbach's  $\alpha$  of the scale was 0.93<sup>[3]</sup> and it was 0.93 in this study.

### Short Form of Cyberchondria Severity Scale (CSS-12)

The Turkish psychometric analysis of the original 33-item scale was performed by Selvi et al.<sup>[25]</sup> (2018). The 12-item form of the scale was shortened by McElroy et al.<sup>[26]</sup> (2019) and published. The validity and reliability of the short scale were made by Yam et al.<sup>[27]</sup> (2021). The scale is in a 5-point Likert structure and has four subdimensions: excessiveness, reassurance, distress, and compulsion. Excessiveness is defined as the increase and repetition of searches on the internet; distress is defined as the anxiety experienced as a result of research; reassurance is defined as the tendency to seek professional medical advice as a result of research; and compulsion is defined as web research that affects all aspects of life. The score that can be captured from the scale ranges from 0 to 60 points. A high total score means that the severity of cyberchondria is high.<sup>[25-27]</sup> The Cronbach  $\alpha$  of the scale was 0.89<sup>[27]</sup> and it was 0.93 in this study.

### Pre-Operative Assessment of Readiness Tool (PART)

It is a measurement tool developed by Torres and Macindo (2018) to measure the preparation perceptions of patients before surgery.<sup>[20]</sup> Turkish validity and reliability were performed by Dolgun et al.<sup>[28]</sup> (2019). The scale, which consists of 15 items and is evaluated with a 6-point Likert type, shows the patient's readiness for surgery. The scale has two subdimensions: interpersonal supportive care assimilation and quality information acquisition. Patients feel ready for surgery after receiving quality information acquisition in the pre-operative period. Interpersonal supportive care assimilation also helps patients feel ready for surgery. The higher the score, the more ready patients are for surgery. The Cronbach  $\alpha$  of the scale was 0.87.<sup>[28]</sup> and it was 0.73 in this study.

### Data Collection Process

The data collection process involved the use of the Socio-demographic and Clinical Characteristics Form, the CS, the Short Form of CSS-12, and the PART. The evaluations of patients within 24 h before the surgery were conducted face-to-face by the researchers.

### Ethical Responsibilities

Approval (Dated February 03, 2023, 2023/68 number) was obtained from the Medical Faculty Non-Invasive Ethics Committee of Afyonkarahisar Health Sciences University for the implementation of the study. Institutional permission (dated December 29, 2022, numbered E.131766) was obtained from the health research and practice center. Verbal and written consent from the patients was obtained. This study adhered to the principles of the Declaration of Helsinki.

### Data Analysis

The statistical Package for the Social Sciences (SPSS) package program (IBM SPSS Version 21.0; Armonk, NY: IBM Corp.) was used for data analysis. The sociodemographic characteristics of the patients were described with the mean, standard deviation, frequency, and percentage. Whether the data conformed to a normal distribution was determined by the Kolmogorov–Smirnov test. The t-test, one-way ANOVA, Mann–Whitney U, and Kruskal–Wallis tests were used in the analysis. Linear regression analysis was applied to analyze the interrelationship between the scales. In all results, statistical differences were accepted if p-values were <0.05.

## Results

The patients' sociodemographic and medical characteristics were given in Table 1.

The mean age was 38.0±9.7 years (min:18-max:72), and 54.1% were women. 42.9% of the patients were between the ages of 18 years and 35. 43.5% of the patients were high school graduates. 49.1% of the patients were employed, 85.1% were married, and all of them had social security. 37.1% of the patients had previous surgery. 15.2% of the patients were patients

**Table 1. Patients' sociodemographic and medical characteristics**

	Mean±SD	Range
Age (years)	38.0±9.7	18–72
Length of Stay (LOS) (days)	4.3±2.5	1–20
	<b>n</b>	<b>%</b>
Gender		
Female	203	54.1
Male	172	45.9
Education		
Primary school	87	23.2
Secondary school	74	19.7
High school	163	43.5
Associate degree	7	1.9
Undergraduate	39	10.4
Graduate	5	1.3
Working		
No	191	50.9
Yes	184	49.1
Marital Status		
Married	319	85.1
Single	56	14.9
Social Security		
Yes	375	100.0
No	-	-
Previous Surgery		
Yes	139	37.1
No	236	62.9
Clinics		
General Surgery	57	15.2
Orthopedics	55	14.7
Gynecology	55	14.7
Neurosurgery	50	13.3
Ear, Nose, and Throat Surgery	55	14.7
Thoracic Surgery	53	14.1
Cardiovascular Surgery	50	13.3
Chronic Disease*		
Yes	160	42.7
No	215	57.3
Device Used*		
Phone	375	100.0
Computer	93	24.8
Tablet	42	11.2
Time Spent on the Internet		
<2 h	73	19.5
2–4 h	80	21.3
More than 4 h	222	59.2

\*More than one option has been ticked.

who would undergo elective surgery in the general surgery clinic. The mean hospital stay of the patients was 4.3±2.5 days (min:1-max:20). All of the patients had a phone, 24.8% had a computer, and 11.2% had a tablet. It was determined that 19.5

of the patients spent <2 h, 21.3% of them spent between 2 and 4 h, and 59.2% of them spent more than 4 h on the Internet (Table 1).

The patients' mean scores of CS, CSS, and PART were given in Table 2.

The mean scores of the PART were 82.7±7.1. The mean score of the quality information acquisition subdimension was 48.5±5.2, and the supportive interpersonal care assimilation subdimension was 34.1±2.5. The mean CS score of the patients was 72.0±17.5, and the CSS-12 score was 33.0±8.6 (Table 2).

The mean scores of CS, CSS, and PART according to the sociodemographic and medical characteristics of the patients were given in Table 3.

A statistically significant difference was detected between the CS mean scores of the patients' age, education, occupational, marital, previous surgery status, ward they received care, chronic disease status, and spending time on the Internet ( $p<0.05$ ). The mean total score of the CS was found to be higher in the 18–35 years of age group, graduate graduates, employees, singles, those who have not had surgery before, those who will have ear, nose, and throat surgery, those who do not have chronic diseases, and those who spend more than 4 h on the Internet. There was no statistical difference between the gender characteristics of the patients and the mean scores of the CS ( $p>0.05$ ) (Table 3).

A statistically significant difference was detected between the mean scores of the CSS-12 of the patient's age, education, occupational, marital, previous surgery status, ward they received care, chronic disease status, and spending time on the Internet ( $p<0.05$ ). The mean total score of the CSS-12 was higher in the 18–35 years of age group: graduate graduates, employees, singles, those who have not had surgery before, those who will have general surgery, those who do not have chronic diseases, and those who spend more than 4 h on the Internet. There was no statistical difference between the gender characteristics of the patients and the mean scores of the CSS-12 ( $p>0.05$ ) (Table 3).

A statistically significant difference was detected between the mean score of the PART among the patient's marital status, previous surgery, and chronic disease status ( $p<0.05$ ). It was determined that those who were unemployed, married, had previous surgery, and had a chronic disease had a high mean score on the PART. There was no statistically significant difference between the groups in the matter of age group, gender, education level, ward where they received care, and spending time on the Internet ( $p>0.05$ ) (Table 3).

The interrelation between the total score of the PART and its subdimensions and the total score of the CS and CSS, and the total score of its subdimensions was given in Table 4.

Multiple regression analysis was performed to test the hypotheses, and the results were presented in Table 4. Multiple regression analyses were conducted for the evaluation of PART total score ( $F=2.648$ ,  $p=0.006$ ), Quality Information Ac-

**Table 2. The mean scores of cyberchondria, cyberchondria severity scale, and the pre-operative assessment of readiness tool and its subdimensions (n=375)**

Scale Subdimensions	Number of items	Patient scale score			
		Scale score Min.-Max.	Mean	SD	Min.-Max.
PART	15	15–90	82.7	7.1	47–90
Quality information acquisition	9	9–45	48.5	5.2	27–54
Interpersonal supportive care assimilation	6	6–30	34.1	2.5	19–36
CS	27	27–135	72.0	17.5	29–115
Factors increasing anxiety	6	6–30	17.6	5.8	6–29
Compulsion/hypochondria	6	6–30	11.0	4.5	6–30
Factors decreasing anxiety	5	5–25	11.3	3.2	5–21
Doctor–patient interaction	4	4–20	12.1	2.5	4–18
Dysfunctional internet use	6	6–30	19.6	5.2	8–30
CSS-12	12	12–60	33.0	8.6	13–60
Excessiveness	3	3–15	9.0	3.0	4–15
Reassurance	3	3–15	9.9	2.2	3–15
Distress	3	3–15	9.5	2.2	3–15
Compulsion	3	3–15	4.5	2.5	3–15

PART: Pre-operative assessment of readiness tool; CS: Cyberchondria scale; CSS-12: Short form of cyberchondria severity scale.

quisition subdimensions ( $F=2.648$ ,  $p=0.006$ ), and Supportive Interpersonal Care Assimilation ( $F=4.336$ ,  $p<0.001$ ), consisting of three different models that were statistically significant. In the analysis, it was determined that the state of cyberchondria affects the patient’s readiness for surgery positively ( $\beta=0.955$ ,  $p=0.026$ ), and the severity of cyberchondria affects it negatively ( $\beta=-0.873$ ,  $p=0.010$ ). It was determined that the doctor–patient interaction subdimension ( $\beta=0.172$ ,  $p=0.040$ ) and dysfunctional Internet use ( $\beta=0.387$ ,  $p=0.026$ ) in the cyberchondria state positively affected the preparation for surgery. The excessiveness subdimension of the cyberchondria severity had a negative effect ( $\beta=-2.083$ ,  $p=0.010$ ), while the distress subdimension ( $\beta=0.349$ ,  $p=0.0004$ ) had a positive effect (Table 4).

## Discussion

This study has shown that the cyberchondria status positively affects patients’ readiness for surgery, indicating that the information they obtain from the Internet contributes positively to their preparedness for surgery. In other words, for the reason that their Internet search, their anxiety about the surgery decreased. It is thought that the information obtained by the patients from the Internet supports the preparation process of the patients in coping with the uncertainty of the surgery. However, it should not be overlooked that the severity of the Internet scanning of the patients negatively affects the preparation for the operation. The excessiveness has to do with the time-consuming and repetitive nature of online health searches. In particular, it is seen that this subdimension has a negative effect. The severity of the disease may be an im-

portant factor here. For this reason, it would be appropriate to evaluate patients who will undergo surgery according to the severity of the disease.

The distress subdimension in CSS-12 includes emotional disturbances and physiological problems experienced as a result of the information obtained from the Internet.<sup>[17]</sup> The positive impact of the distress subdimension on readiness for surgery suggests that the sleep disturbances, tachycardia, anxiety, and worry experienced by the patient due to the information they acquired may affect their readiness for surgery. Patients may have engaged in Internet information-seeking behavior to reduce the symptoms, such as emotional disturbances and sleep disorders, they experienced due to pre-operative anxiety. A study has indicated that individuals with high levels of anxiety, exhibiting these symptoms related to their health, tend to spend longer periods searching the Internet.<sup>[29]</sup> For symptoms such as pain, it may have diverted attention as a non-pharmacological method.

One of the factors that affects the process of undergoing surgery is the patient–physician relationship. Establishing and maintaining trust in the physician is a focal point of communication. Lack of information about what will be done regarding their health increases anxiety levels. Establishing healthy communication with their physician plays a crucial role in controlling anxiety. In the study by Murray et al.<sup>[30]</sup> (2003), the majority of individuals seeking medical care (71%) valued the physician’s opinion more than seeking alternative remedies. This finding emphasizes the importance of trust in the physician–patient relationship. In addition, Diaz et al.<sup>[31]</sup> (2002) found in their study that 52% of the 512 patients who went over the Internet to get information about health problems



**Table 3. The mean scores on the cyberchondria, cyberchondria severity scale and the evaluation of readiness for surgery by sociodemographic and medical characteristics (n=375)**

Variables	CS (Mean±SD)	p-value	CSS-12 (Mean±SD)	p-value	PART (Mean±SD)	p-value
Age (Mean±SD) 38.0±9.7						
18–35	79.8±15.3 <sup>a</sup>	40.478***	36.7±8.1 <sup>a</sup>	32.051***	82.6±7.4	1.888*
36–45	69.4±16.9 <sup>b</sup>	<0.001	31.1±8.2 <sup>b</sup>	0.001	82.2±7.0	0.389
46 and over	61.1±15.6 <sup>c</sup>		28.9±7.2 <sup>c</sup>		83.5±6.6	
Gender						
Female	72.7±17.8	0.878****	33.2±8.5	0.394****	83.5±6.1	0.489**
Male	71.1±17.2	0.381	32.8±8.7	0.694	81.7±7.8	0.625
Education						
Primary school	58.1±14.7 <sup>d</sup>	32.841***	27.3±6.9 <sup>c</sup>	27.140***	82.0±7.9	0.845***
Secondary school	69.0±16.2 <sup>c</sup>	<0.001	31.2±8.1 <sup>b</sup>	<0.001	83.5±6.3	0.519
High school	75.3±14.8 <sup>b</sup>		34.1±7.5 <sup>b</sup>		82.8±7.4	
Associate degree	83.5±13.0 <sup>a</sup>		36.0±6.0 <sup>b</sup>		81.2±5.7	
Undergraduate	89.4±11.5 <sup>a</sup>		41.8±6.9 <sup>a</sup>		83.1±5.5	
Graduate	99.0±10.6 <sup>a</sup>		48.2±4.6 <sup>a</sup>		78.0±6.5	
Working						
No	68.9±17.9	-3.556****	31.8±8.7	-2.864****	83.3±6.4	-0.606**
Yes	75.2±16.6	<0.001	34.3±8.3	0.004	82.0±7.7	0.545
Marital status						
Married	70.0±17.2	-5.245****	32.1±8.3	-5.226***	83.0±6.7	-5.171**
Single	83.0±15.5	<0.001	38.4±8.0	<0.001	80.7±9.6	<0.001
Previous surgery						
Yes	66.0±17.1	-5.226****	30.4±8.2	-4.749**	83.0±6.3	-4.749**
No	75.5±16.9	<0.001	34.5±8.4	0.001	82.5±7.5	<0.001
Clinics						
General surgery	78.7±18.8 <sup>a</sup>	4.511***	38.0±10.3 <sup>a</sup>	6.053****	82.3±5.6	10.398*
Gynecology	67.7±16.1 <sup>b</sup>	<0.001	29.9±6.5 <sup>b</sup>	<0.001	84.3±6.1	0.109
Ear, nose and throat surgery	78.9±17.2 <sup>a</sup>		35.1±8.2 <sup>a</sup>		81.6±7.5	
Orthopedics	68.3±16.8 <sup>b</sup>		32.3±8.3 <sup>b</sup>		81.3±8.4	
Thoracic surgery	69.6±16.1 <sup>b</sup>		31.6±7.9 <sup>b</sup>		84.1±6.7	
Neurosurgery	67.7±18.6 <sup>b</sup>		31.7±8.8 <sup>b</sup>		81.8±7.9	
Cardiovascular surgery	71.2±15.5 <sup>b</sup>		31.9±7.0 <sup>b</sup>		83.3±6.9	
Chronic disease						
Yes	68.0±17.3	-3.848****	31.3±8.2	-3.332***	83.3±6.7	-3.332**
No	74.9±17.2	<0.001	34.2±8.6	0.001	82.2±7.4	0.001
Time Spent on the Internet						
<2 h	58.5±14.3 <sup>c</sup>	65.251***	27.8±7.1 <sup>b</sup>	75.753*	83.2±7.3	1.440*
2–4 h	64.1±14.9 <sup>b</sup>	<0.001	29.6±7.4 <sup>b</sup>	<0.001	82.3±6.9	0.487
More than 4 h	79.3±15.5 <sup>a</sup>		35.9±8.1 <sup>a</sup>		82.7±7.1	

\*KW: Kruskal–Wallis; \*\* Mann–Whitney U; \*\*\* One way Anova; \*\*\*\* t test, a > b > c > d. PART: Pre-operative assessment of readiness tool; CS: Cyberchondria scale; CSS-12: Short form of cyberchondria severity scale.

did not share this information with their doctors because the information they obtained was unreliable. This finding could be associated with concerns about receiving unexpected reactions or acquiring accurate information. There are also literature studies indicating that Internet use harms the patient–physician relationship. In a study conducted by Çetin and Özhanlı (2018) on surgical patients, it was stated that

they used the information they obtained as a result of internet browsing to make decisions about their health problems, which was deemed unreliable for patients.<sup>[18]</sup> When examining the impact of the quality of information acquisition, which is a subdimension of evaluating the readiness for surgery, it was found that the doctor–patient interaction within the context of cyberchondria positively influenced the readiness for

**Table 4. Results of linear regression analysis of cyberchondria variables interpersonal supportive care assimilation, quality information acquisition subdimensions, and total score of the pre-operative assessment of readiness tool (n=375)**

	<b>B (%95 CI)</b>	<b>Beta</b>	<b>t</b>	<b>p</b>	<b>Zero-order</b>	<b>Partial</b>
<b>1. Quality information acquisition (Model 1)</b>						
Factors increasing anxiety	-0.046	-0.051	-0.670	0.503	0.577	-0.035
Compulsion/hypochondria	0.002	0.002	0.018	0.986	0.035	0.001
Factors decreasing anxiety	0.139	0.086	1.318	0.188	0.102	0.069
Doctor-patient interaction	0.423	0.207	2.472	0.014	0.169	0.128
Dysfunctional Internet use	0.282	0.284	2.260	0.027	0.122	0.116
CS	0.282	0.949	2.226	0.027	0.108	0.116
Excessiveness	-0.429	-0.252	-2.099	0.037	0.067	-0.109
Reassurance	0.188	0.082	0.690	0.491	0.064	0.036
Distress	0.635	0.269	2.219	0.027	0.081	0.115
Compulsion	0.171	0.082	0.586	0.558	-0.019	0.031
CSS-12	-0.429	-0.707	-2.099	0.037	0.056	-0.109
F=2.648, p=0.006, Adj.R2=0.038, SE=5.133						
<b>2. Interpersonal supportive care assimilation (Model 2)</b>						
Factors Increasing Anxiety	-0.047	-0.108	-1.446	0.149	-0.164	-0.075
Compulsion/Hypochondria	0.074	0.132	1.103	0.271	-0.163	0.058
Factors Decreasing Anxiety	0.024	0.031	0.478	0.633	-0.095	0.025
Doctor-Patient Interaction	0.058	0.058	0.708	0.479	-0.089	0.037
Dysfunctional Internet Use	0.105	0.217	1.734	0.084	-0.130	0.090
CS	0.105	0.725	1.734	0.084	-0.165	0.090
Excessiveness	-0.294	-0.355	-3.007	0.003	-0.196	-0.155
Reassurance	0.243	0.217	1.870	0.062	-0.129	0.097
Distress	0.488	0.424	3.569	<0.001	-0.061	0.184
Compulsion	-0.023	-0.023	-0.168	0.867	-0.229	-0.009
CSS-12	-0.294	-0.994	-3.007	0.003	-0.186	-0.155
F=4.336, p<0.001, Adj.R2=0.074, SE=2.453						
<b>Total PART (Model 3)</b>						
Factors increasing anxiety	-0.093	-0.076	-0.998	0.319	-0.017	-0.052
Compulsion/hypochondria	0.077	0.049	0.399	0.690	-0.033	0.021
Factors decreasing anxiety	0.163	0.074	1.134	0.258	0.041	0.059
Doctor-patient interaction	0.481	0.172	2.060	0.040	0.092	0.107
Dysfunctional Internet use	0.387	0.285	2.240	0.026	0.043	0.116
CS	0.387	0.955	2.240	0.026	0.020	0.116
Excessiveness	-0.723	-0.312	-2.083	0.010	-0.021	-0.134
Reassurance	0.431	0.137	1.161	0.246	0.001	0.061
Distress	1.123	0.349	2.877	0.004	0.038	0.149
Compulsion	0.148	0.052	0.371	0.711	-0.096	0.019
CSS-12	-0.723	-0.873	-2.592	0.010	-0.025	-0.134
F=2.648, p=0.006, Adj.R2=0.038, SE=7.003						

B: Unstandardized coefficient; Beta: Standardized coefficient; PART: Pre-operative assessment of readiness tool; CS: Cyberchondria scale; CSS-12: Short form of cyberchondria severity scale.

surgery. This result suggests that the communication between patients and their doctors is positively influenced by the information patients gather from the Internet, and it facilitates the understanding of the explanations provided by the doctors, which is a crucial aspect of acquiring the necessary knowledge for readiness for surgery. Consulting and discussing the

information patients acquire with their doctors and clarifying this information enhances readiness for surgery. This situation can turn into a collaborative process between the patient and the doctor in terms of managing the outcomes of the surgery based on the knowledge acquired. Dysfunctional Internet use, which is a subdimension of the CS, positively influences the

quality of information acquisition and readiness for surgery. Patients searching for information, believing that they have a serious illness related to their surgery, support being ready for surgery and acquiring quality information.

### Strengths and Limitations

This was the first study that examined the interrelation between cyberchondria status, cyberchondria severity, and readiness for surgery in patients undergoing surgery. The study was conducted in one center and contains a partial result. Therefore, the results obtained from the study conducted in a single center cannot be generalized to other patients. In addition, the fact that the data in the study were based on the self-reports of the patients and the inclusion of individuals who can use the internet may have limited the ability to draw valid conclusions. Since there are not enough studies in the literature examining the effect of cyberchondria status and severity of cyberchondria on the preparation of patients who will undergo surgery, a comparison was made with studies examining the effect of obtaining information from the internet on the decision to undergo surgery.

### Conclusion

It has been determined that in patients undergoing surgery, readiness for surgery was positively influenced by cyberchondria status, while it was negatively influenced by cyberchondria severity. It is suggested that cyberchondria status and severity explain only a limited portion of readiness for surgery, and factors such as personality traits and Internet attachment should be investigated in larger study groups to understand their impact. In addition, studies examining the effect of cyberchondria states on patient outcomes will make a significant contribution to the literature.

According to the results of this study, cyberchondria had a positive effect on readiness for surgery, but excessive intensity had the opposite effect. Although the information obtained creates anxiety in the person, conscious information acquisition and correct sources should be created to control this and not be caught up in unfounded information. It is thought that the more this conscious behavior develops, the less the severity of cyberchondria will decrease, thus positively affecting the readiness for surgery. In this direction, it can be suggested that the informative role of nurses should be emphasized, hospitals should create brochures for surgical preparation, or institutions should create an information platform about the surgical procedure on their websites.

To increase the readiness of patients for surgery, access to secure information about their diseases can be provided by health institutions in a controlled electronic environment. Thus, surgical patients' readiness for surgery can be positively supported, their access to unnecessary information can be prevented, and they can be protected from health anxiety. Surgical nurses can provide the necessary training to reduce the severity of cyberchondria.

**Ethics Committee Approval:** Approval (Dated February 03, 2023, 2023/68 number) was obtained from the Medical Faculty Non-Invasive Ethics Committee of Afyonkarahisar Health Sciences University for the implementation of the study. Institutional permission (dated December 29, 2022, numbered E.131766) was obtained from the health research and practice center. Verbal and written consent from the patients was obtained. This study adhered to the principles of the Declaration of Helsinki.

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### References

- Deniz S. Bireylerin E-sağlık okuryazarlığı ve siberkondri düzeylerinin incelenmesi. *İnsan ve İnsan* 2020;7:84–96.
- Doherty-Torstrick ER, Walton KE, Fallon BA. Cyberchondria: Parsing health anxiety from online behavior. *Psychosomatics* 2016;57:390–400.
- Uzun SU, Zencir M. Cyberchondria and associated factors among university staff. *ESTUDAM Public Health J* 2022;7:257–68.
- Durak Batıgün AD, Gör N, Kömürcü B, Ertürk İŞ. Cyberchondria Scale (CS): Development, validity and reliability study. *Düşünen Adam J Psychiatr Neurol Sci* 2018;31:148–62.
- Güzel S, Özer Z. Cyberchondria levels and affecting factors in heart patients. *Turk J Card Nurs* 2021;12:36–46.
- Mansur F, Çiğerci K. The relationship between cyberchondria and e-health literacy. *Gümüşhane Univ J Health Sci [Article in Turkish]* 2022;11:11–21.
- Fergus TA. The Cyberchondria Severity Scale (CSS): An examination of structure and relations with health anxiety in a community sample. *J Anxiety Disord* 2014;28:504–10.
- Manganello JA. Health literacy and adolescents: A framework and agenda for future research. *Health Educ Res* 2008;23:840–7.
- White RW, Horvitz E. Cyberchondria: Studies of the escalation of medical concerns in web search. *ACM Trans Inf Syst* 2009;27:1–37.
- Starcevic V, Berle D. Cyberchondria: Towards a better understanding of excessive health-related Internet use. *Expert Rev Neurother* 2013;13:205–13.
- Tarhan N, Tutgun-Ünal A, Ekinci Y. New generation disease cyberchondria: Relationship between cyberchondria and health literacy of generations in the new media age. *OPUS Int J Soci Res* 2021;17:4253–97.
- Newby JM, McElroy E. The impact of internet-delivered cognitive behavioural therapy for health anxiety on cyberchondria.



- J Anxiety Disord 2020;69:102150.
13. Baumgartner SE, Hartmann T. The role of health anxiety in online health information search. *Cyberpsychol Behav Soc Netw* 2011;14:613–8.
  14. Bajcar B, Babiak J. Self-esteem and cyberchondria: The mediation effects of health anxiety and obsessive–compulsive symptoms in a community sample. *Curr Psychol* 2021;40:2820–31.
  15. Starcevic V. Cyberchondria: Challenges of problematic online searches for health-related information. *Psychother Psychosom* 2017;86:129–33.
  16. Khazaal Y, Chatton A, Rochat L, Hede V, Viswasam K, Penzenstadler L, et al. Compulsive health-related internet use and cyberchondria. *Eur Addict Res* 2021;27:58–66.
  17. Erdođan A, Hocaoglu C. Cyberchondria: A review. *Curr App Psychiatr* 2020;12:435–43.
  18. Çetin İ, Özhanlı Y. The characteristics of internet usage of surgical patients accessing health information. *J Health Sci Kocaeli Univ [Article in Turkish]* 2018;4:44–9.
  19. Çađlar S, Gençer Şendur E. Sađlığın geliştirilmesinde e-sađlık okuryazarlığı ve siberkondri. In: Tüfekci N, editör. Sađlık bilimlerdeki farklılıkları açıklamaya yönelik arařtırmalar. Klaipeda: SRA Academic Publishing. 2023. s.1-18. [In Turkish] Eriřim adresi: [bit.ly/4c3XT7w](https://bit.ly/4c3XT7w). Eriřim tarihi Şub 28, 2024.
  20. Torres GCS, Macindo JRB. Scale development and psychometric evaluation of the preoperative assessment of readiness tool. *J Perianesth Nurs* 2018;33:895–907.
  21. Sawatzky R, Russell L, Friberg F, Carlsson EK, Pettersson M, Öhlén J. Longitudinal person-centered measurement: A psychometric evaluation of the Preparedness for Colorectal Cancer Surgery Questionnaire (PCSQ). *Patient Educ Couns* 2017;100:827–35.
  22. Torres GCS, Relf MV, Tuazon JA. The mediating role of pre-operative patient readiness on surgical outcomes: A structural equation model analysis. *J Adv Nurs* 2020;76:1371–83.
  23. Bao G, Liu Y, Zhang W, Yang Y, Yao M, Zhu L, et al. Psychometric properties of the Chinese version of the preoperative assessment of readiness tool among surgical patients. *Front Psychol* 2022;13:916554.
  24. Menon V, Kar SK, Tripathi A, Nebhinani N, Varadharajan N. Cyberchondria: Conceptual relation with health anxiety, assessment, management and prevention. *Asian J Psychiatr* 2020;53:102225.
  25. Selvi Y, Turan SG, Sayın AA, Boysan M, Kandeger A. The cyberchondria severity scale (CSS): Validity and reliability study of the Turkish version. *Sleep Hypn* 2018;20:241–6.
  26. McElroy E, Shevlin M. The development and initial validation of the cyberchondria severity scale (CSS). *J Anxiety Disord* 2014;28:259–65.
  27. Yam FC, Korkmaz O, Griffiths MD. The association between fear of Covid-19 and smartphone addiction among individuals: The mediating and moderating role of cyberchondria severity. *Curr Psychol* 2023;42:2377–90.
  28. Dolgun E, Okgün Alcan A, Yavuz Van Giersbergen M. Ameliyata hazır olmanın değerlendirilmesi aracının geçerlik ve güvenilirliği. 3. Uluslararası Türk Cerrahi ve Ameliyathane Hemşireliği Kongresi. 2019. Eriřim adresi: <https://tcahdkongreleri.com/gorseller/files/kongre-kitaplar/2019-kitap.pdf>. Eriřim tarihi Şub 28, 2024.
  29. Muse K, McManus F, Leung C, Meghreblian B, Williams JM. Cyberchondriasis: Fact or fiction? A preliminary examination of the relationship between health anxiety and searching for health information on the Internet. *J Anxiety Disord* 2012;26:189–96.
  30. Murray E, Lo B, Pollack L, Donelan K, Catania J, White M, et al. The impact of health information on the internet on the physician-patient relationship: patient perceptions. *Arch Intern Med* 2003;163:1727–34.
  31. Diaz JA, Griffith RA, Ng JJ, Reinert SE, Friedmann PD, Moulton AW. Patients' use of the Internet for medical information. *J Gen Intern Med* 2002;17:180–5.