Original Article

Investigating the relationship and effect between health anxiety level and severity of cyberchondria in surgical patients

Seda Ceylan[1], Seyma Colak[1], Özlem Şahin Akboga[1]

ABSTRACT

Background

The uncertainty of the results of surgical interventions and the patient's fear of undergoing surgery increase health anxiety. The increased level of anxiety leads the individual to search for online information that is easy to access and cost-effective.

Aim

This study aimed to investigate the relationship and effect between anxiety level and severity of cyberchondria in surgical patients.

Methods

The study was descriptive, correlational, and exploratory. Data were collected using the Personal Characteristics Form, Health Anxiety Inventory, and Cyberchondria Severity Scale Short Form (CSS-12). The study was conducted with 300 surgical patients in the postoperative period between July and November 2023. Correlation and multiple regression analyses were performed to investigate the relationship between health anxiety and cyberchondria severity.

Results

There was a moderate positive correlation between participants' health anxiety and cyberchondria severity scales ($r=0.422$ $p<0.001$). Cyberchondria severity explained 17.8% of health anxiety and was a positive predictor. In surgical patients, the subscales of the cyberchondria severity scale explained 19.4% of health anxiety. The reassurance-seeking and compulsion subscales of the cyberchondria severity scale were positive predictors of health anxiety, while the excessiveness and distress subscales were not predictors.

Conclusion

The severity of cyberchondria in surgical patients was moderately correlated with health anxiety inventories and partially explained health anxiety. This study showed that seeking reassurance and information from other sources to the point of interrupting activities of daily living increased health anxiety. Studies that include more factors that may explain the health anxiety of surgical patients in the Turkish population should be conducted.

Keywords

Anxiety; Surgery patient; Surgery nursing; Cyberchondria

INTRODUCTION

In the world, 67.9% of the population (5.385.798.406 people) use the Internet. According to the "World Internet Users Statistics" survey, Internet usage in 2022 was 54.2% in Asia, 13.9% in Europe, 11.2% in Africa, and 9.9% in Latin America [1]. According to TURKSTAT's "Proportion of Households with Internet Access Survey", while the Internet usage rate in Turkey was 55.9% in 2015, this rate was reported to be 94.1% in 2022. It was determined that Turkish society mostly uses the Internet to search for health-related information (69.3%) [2]. According to the latest health statistics yearbook report in Turkey, the number of patients undergoing surgery in a year (2020-2021) is approximately five million [3]. It is inevitable that the Internet, which is increasingly used in the health field, is also be used by surgical patients. Individuals are likely to start looking for information about their illness online from the Internet, which is easy to access, rather than from their social environment, doctors, and nurses [4]. The Internet offers many advantages for seekers, such as easy access, cost-effectiveness, and the availability of many sources of information [5]. Despite these advantages, the Internet can increase health inequalities and provide Internet users with access to confusing, distrustful, inaccurate or outdated information [6]. These negativities

1. Faculty of Health Sciences, University of Yozgat Bozok, P.O. Box 66000, Center, Yozgat, Turkey.

Correspondence

Ozlem Sahin Akboga, Assistant Professor, Faculty of Health Sciences, University of Yozgat Bozok, P.O. Box 66000, Center, Yozgat, Turkey. Adress: Çapanoğlu Street. Cemil Çiçek main street, Bozok Üniversitesi Erdoğan Akdağ Campus, Atatürk Road 7. km, 66100 Yozgat, E-mail: ozlemsahin.os17@gmail.com;

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may contribute to increased health anxiety in patients [6,7]. "Cyberchondriasis", a combination of the terms "cyber" and "hypochondriasis", is used to describe the negative consequences of acquiring health information online [5]. The intensification of health anxiety as a result of repetitive medical information searches on the Internet has named "cyberchondriasis" [8], and people who obsessively search for health information on the Internet about specific symptoms, real or imaginary, have been defined as "cyberchondriac" [9]. Cyberchondriacs can easily access the information they want with the help of search engines. However, most of the information shared on the Internet about health needs to be confirmed in terms of reliability, quality, and accuracy [6].

Health anxiety is a psychological state in which an unfavorable health-related situation triggers bodily and mental concerns. Health anxiety is common in individuals with somatoform and psychological disorders as well as in ordinary people. Individuals who experience a serious health problem think about the negative consequences [10]. It has been reported that individuals undergoing surgical intervention have high levels of anxiety[11] and are at risk for depression [12]. Anxiety and depression are known to reduce the quality of life in the postoperative period, negatively affect the recovery of diseases, and increase healthcare costs and comorbidities [13]. Anxiety in the patient undergoing surgical intervention is a multifactorial problem, and surgical nurses should evaluate the anxiety in patients. Providing information is the best way to reduce anxiety [14]. It has been reported that individuals who are not adequately informed and have high health anxiety frequently seek medical information online [15]. It is estimated that there are 60 million Internet users in Turkey [2], and studies on the effects of Internet use on health are minimal [10]. Therefore, it is necessary to understand the developing technological opportunities and be aware of potential health threats [16]. The impact of online searches on patients undergoing a frightening procedure such as surgery that affects health anxiety should be reported [17]. With this study, we aimed to determine the relationship and effect between the level of health anxiety and the severity of cyberchondria in patients undergoing surgical intervention. This study allows for an understanding of the cause of health anxiety in the surgical patient. At the same time, the study will guide the surgical nurses in reducing the patient's anxiety. Furthermore, understanding surgical patients' anxiety will help provide quality nursing care. Successful reduction of anxiety in the surgical patient will indirectly affect adverse outcomes.

Hypotheses of the study

H_1: There is a relationship between health anxiety and the severity of cyberchondria in patients undergoing surgical intervention.

H_2: There is an effect between health anxiety and the severity of cyberchondria in patients undergoing surgical intervention.

MATERIALS AND METHODS

Research design

This descriptive study was conducted in the postoperative period (post-op 2nd-3rd day) between July and November 2023. We aimed to determine the relationship and effect between health anxiety and the severity of cyberchondria in the postoperative period.

Study population and sample

The study population consisted of adult patients undergoing surgical intervention in a public hospital in the Central Anatolia Region of Turkey. This center performs neurosurgery, general surgery, plastic surgery, gynecological surgery, ophthalmology, otolaryngology, orthopedics, and urology surgeries. Patients who were over 18 years of age, who underwent surgery in these surgical clinics, who were on the 2nd-3rd postoperative day, who were not taking medications that might affect their cognitive perception, or who had not undergone surgical interventions [such as brain surgeries], and who agreed to participate in the study were included. Patients who were unable to communicate in Turkish and who had conditions that would prevent them from communicating (such as pain, mental retardation, general condition disorder) were not included in the study.

G*Power 3.1.9.4 software was used to calculate the number of people included in the study and determine the sample size. Blackburn et al. (2019)[17] investigated the effects of Cyberchondria Severity and confounding factors on Health Anxiety. In this study, it was determined that cyberchondria level can explain at least 6.9% of health anxiety. As a result, it was determined that there should be 269 observations in the sample with a 95% statistical power level and a 5% significance level for the calculated effect size (f^2 =0.036). In the study, 17

patients did not meet the inclusion criteria, 314 surgical patients were invited, 14 patients refused to participate, and the study was completed with 300 patients.

Variables

In this study, cyberchondria severity sub-dimensions, excessiveness, distress, reassurance-seeking, and compulsion were predictor variables. Health anxiety and cyberchondria severity scale were outcome variables.

Data collection tools

Data was collected by "Personal Characteristics Form", "Health Anxiety Inventory", and "Cyberchondria Severity Scale Short Form (CSS-12)".

Personal Characteristics Form: This form was prepared in line with the literature,[10,17-19] included 16 questions on personal (age, gender, education and marital status, presence of chronic diseases, smoking status, presence of a health professional in the family, and duration of Internet use (hours/day)) and health-related characteristics (previous surgery, type of surgery, reading health-related publications, watching television, participating in a panel, being examined by a physician in the last year, use of non-physician medication, and number of treatments).

Health Anxiety Inventory (HAI): The Turkish validity and reliability study of this scale, which was developed by Salkovskis et al. (2002) to assess health anxiety, was conducted by Aydemir et al. (2013) [20,21]. "Hypersensitivity to physical symptoms and anxiety" is the scale's first sub-dimension, and 14 question items constitute this sub-dimension. "Negative consequences of illness" is the other sub-dimension and consists of the remaining four question items. This sub-dimension asks patients to speculate on what their mental state might be like under the assumption that they have a serious illness and questions them accordingly. The scoring of the scale is between 0-3 for each item, and a high score indicates a high level of health anxiety. In the reliability analysis of the scale, Cronbach's alpha internal consistency coefficient was 0.91 [21], while it was determined to be 0.77 in the present study.

Cyberchondria Severity Scale (CSS-12) Short Form: The scale measures the level of "Cyberchondria", defined as an increase in anxiety that occurs due to individuals seeking information about their health conditions through online platforms. The Cyberchondria Severity Scale (CSS) was developed by McElroy et al. in 2014 [22]. The Turkish validity and reliability study of the scale was conducted by Yorgancıoğlu Tarcan et al. (2023) [23]. The scale consists of 4 dimensions and 12 items and is a 5-point Likert scale (1=never, 2=rarely, 3=occasionally, 4=often, 5=always). The **"excessiveness"** subscale (items 1, 3, and 6) refers to excessive or repeated medical information-seeking behavior on the Internet; the **"distress"** subscale (items 4, 8, and 9) refers to psychological feelings such as insomnia and depression caused by negative online searches; the **"reassurance-seeking"** subscale (items 5, 11, and 12) refers to the behavior of seeking reassurance from other sources such as medical professionals; the **"compulsion"** subscale (items 2, 7, and 10) refers to the interruption of users' daily lives due to intense online searches. High scores on the scale indicate a high level of cyberchondria [22]. Cronbach's alpha internal consistency coefficient of the original scale is 0,80 [23], that it was determined to be 0.90 in the present study.

Data collection

Ethics committee approval and institutional permission were obtained to conduct the study. Surgical unit supervisors were interviewed. Informed consent forms were obtained from patients who met the inclusion criteria. The first two investigators collected the questionnaire using a face-to-face interview technique. It took approximately 15 minutes to complete the forms.

Analysis of data

In the study, the relationship between health anxiety and cyberchondria was examined using descriptive statistics and advanced statistical tests (Kolmogorov-Smirnov, Spearman's rho, multiple linear regression). Normality assumption was checked and statistical significance level was set as 0.05.

Ethical approval

Before starting the research, ethical approval was obtained from the local ethics committee (Decision no: 04/18 Date: 20.06.2023) and then institutional permission. Patients participating in the research also gave their informed consent in writing.

RESULTS

The mean age of the participants was 55.93±17.39 years, 56% of them were female, 82% were married, 61% were graduates of primary and secondary education, 45% had chronic diseases, 55% did not smoke, 66% did not have a healthcare professional in the family, and participants used the Internet for an

average of 1.53±1.86 hours per day. Moreover, 32% of the participants had not undergone surgery, 84% did not read health-related publications, 33% did not watch TV programs, 95% did not participate in panels, 35% had not been examined by a physician in the last year, 92% did not use drugs without physician approval, and 89.7% did not receive medical treatment (Table 1).

The mean score on the HAI was 33.8 ± 7.9, and the mean score on the CSS was 20.7 ± 10.5 (Table 2).

According to Table 3, a moderate positive significant correlation was determined between the total scores of the participants' HAI and CSS (r = 0.422 p < 0.001). Furthermore, a low-level positive significant correlation was determined between the sub-dimensions of the HAI and the CSS (p<0.05).

The results of the regression analysis (enter method) of the sub-dimensions of cyberchondria severity for predicting health anxiety are presented in Table 4. The effect of cyberchondria severity on health anxiety was determined to be significant ($F=64$.434; $p<0$.001). It was determined that health anxiety increased by 0.285 units when the score of cyberchondria severity increased by one unit. With the model obtained (score=26.771 + 0.285*), 17.8% of health anxiety was explained. Hence, cyberchondria severity level was a predictor of health anxiety (Figure 1). The method was created again to understand the effect of the cyberchondria severity on health anxiety. The impact of "excessiveness" and "distress" sub-dimensions of cyberchondria severity on health anxiety was not significant ($\beta=0$.085, $p=0$.311; $\beta=0$.126, $p=0$.156, respectively), while the effect of "reassurance-seeking" and "compulsion" sub-dimensions was significant ($\beta=0$.187, $p=0$.011; $\beta=0$.155, $p=0$.010, respectively). With the model obtained (score=25.779 + 0.464* (reassurance-seeking) + 0.645* (compulsion)), 19.4% of health anxiety was explained (Table 4). In other words, the reassurance-seeking and compulsion subscales of cyberchondria severity were positive predictors of health anxiety, while the excessiveness and distress subscales were not predictors.

DISCUSSION

Cyberchondria is a clinical condition of increased health anxiety, intolerance of uncertainty associated with repetitive health-related online searches [24]. Health anxiety is affected by the surgical process, which is an unpleasant and uncomfortable experience [25], and negatively affects the surgical process [26]. To our knowledge, this is the first study to investigate the relationship and effect between health anxiety and cyberchondria severity in surgical patients.

National and international sources have also shown that patients have moderate or high levels of anxiety during the surgical process [27,28]. Non-severe health anxiety is a condition that can pass or be tolerated on its own [10]. In the present study, we can say that surgical patients were able to manage moderate health anxiety (33.8 ± 7.9), and tolerate the surgical process, and therefore, the level of cyberchondria decreased (20.7 ± 10.5).

The most crucial reason for online searching with health-related information is to reduce anxiety or to take action to reduce anxiety [29]. Cyberchondria is often linked to health anxiety. Moderate to strong relationships between these two definitions have been reported previously [30-32]. Although health anxiety and cyberchondria are closely related, it is emphasised that they are two different conditions [33-34]. On the contrary, the relationship between cyberchondria and health anxiety has been found to be weak [35-36], in the present study, it was determined that there was a moderate. It was found that there was a low level relationship between health anxiety and the sub-dimensions of the cyberchondria severity scale (reassurance seeking, distress, extremism and compulsion, respectively). Although the majority of surgical patients stated that they did not use medication without physician approval (92%) and did not participate in activities such as reading health-related publications (84%) and panel discussions (95%), we can say that they were in reassurance-seeking regarding medical information. Cyberchondria has also been shown to be positively associated with poor sleep quality, health anxiety and depression during the COVID-19 pandemic [37]. Moreover, it was reported that sleep quality worsened as the severity of cyberchondria increased in 2.744 Chinese university students [38]. Excessive and uncontrolled efforts to access this information may have negative effects on the psychological health of the individual [34,39]. It has been reported that Lebanese adults with positive affect have a higher quality of life and that there is a low-level negative relationship between physical and mental quality of life and cyberchondria severity [40]. These studies[34,39-40] supported the present study's findings, and hypothesis H_1 was accepted.

In the present study, it was observed that the effect of cyberchondria severity on health anxiety was 17.8%;

this rate increased in its sub-dimensions (19.4%), and hypothesis H_2 was accepted. The fact that surgical patients seek reassurance through online searches and that quality of life is affected was included in the model that can explain health anxiety. After controlling for a few specific variables in orthopedic patients, cyberchondria explains about a third (33%) of health concerns caused by deficiencies in people's ability to cope with uncertainty. It shows that cyberchondria behaviour plays an important role in increasing the health anxiety of intolerance to uncertainty. It was reported that intolerance of uncertainty may have possibly created a bidirectional relationship between cyberchondria and health anxiety [17]. No evidence was determined in the literature on the relationship between factors such as health anxiety and the severity of cyberchondria in patients undergoing other surgical procedures. In a young and healthy population, 40% of the variance in cyberchondria was shown to be due to health anxiety [41]. The reason for the differences in the rates may be the inclusion of different participants in the studies and different mediating models affecting health anxiety. Further studies are needed to investigate the relationship between health anxiety and cyberchondria severity in surgical patients.

Limitations of the study

The strength of this study is that, to our knowledge, this is the first study to investigate the relationship between health anxiety and cyberchondria severity in adults undergoing surgical intervention. Moreover, there are few centers in the province where the research and surgical intervention were conducted. Another significant limitation is that the results can only be generalized to this patient group. Besides, we think that the variance that can be explained is affected by the descriptive characteristics of the patient population.

Conclusion and recommendations:

This study evaluated the relationship and effect between health anxiety and cyberchondria severity in surgical patients and made important contributions to the literature. According to the results obtained, it was determined that patients undergoing surgical intervention had moderate health anxiety and low cyberchondria severity, and there was a moderate and positive significant relationship between these two phenomena. In the regression analysis between the two scales, cyberchondria severity was determined to be a predictor of health anxiety (17.8%), and "reassurance-seeking" and "compulsion" sub-dimensions could explain health anxiety significantly and increased the rate of explanation (19.4%). In the literature, the findings on the subject related to surgical patients were quite limited. Surgical nurses should regularly evaluate patients' anxiety and try to understand the factors affecting it. It is recommended to examine the effect of different factors affecting health anxiety in patients undergoing surgical intervention. Determining the factors affecting health anxiety may direct the content of the information, education, and care given to patients.

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Authors's contribution:

Data gathering and idea owner of this study: S.C., S.B., O.S.A.

Study design: O.S.A.

Data gathering: S.C., S.B.

Writing and submitting manuscript: S.C., S.B., O.S.A.

Editing and approval of final draft: S.C., S.B., O.S.A.

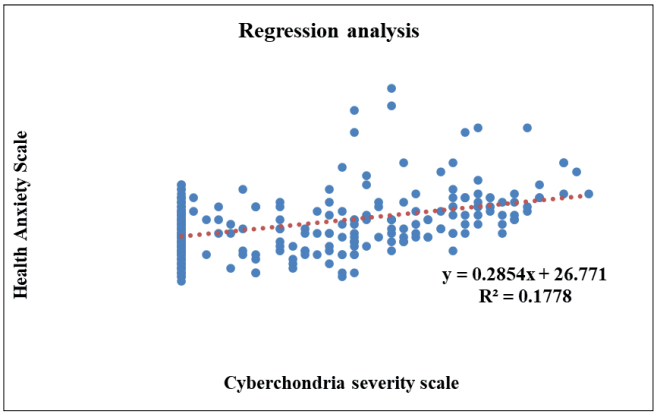

Figure 1. Regression analysis between the Cyberchondria Severity Scale and the Health Anxiety Scale

Table 1. Descriptive characteristics of the participants (n: 300)

Personal characteristics	*M* ± *SD* or n(%)
Age	55.93±17.39
Gender	
Female	168 (%56)
Male	132 (%44)
Marital status	
Single	54 (%18)
Married	246 (%82)
Education status	
None	52 (%17)
Primary-Middle	183 (%61)
High school	45 (%15)
Licence	20 (%7)
Presence of chronic disease	
There is	136 (%45)
None	164 (%55)
Smoking status	
No	200 (%67)
Used and Left	43 (%14)
Uses	57 (%19)
Presence of a health professional in the family	
None	199 (%66)
There is	101 (%34)
Duration of Internet use (hour/day)	1.53±1.86
Health related properties	
Previous surgery	1.51±1.76
None	96 (%32)
1 - 4 times	186 (%62)
5-10 times	18 (%6)
Type of surgery	
Orthopedics	52 (%17)
KBB-Plastic	153 (%52)
Eye surgery	38 (%13)
Gyn. surgery	28 (%9)
Urology	25 (%8)
General surgery	4 (%1)
Brain surgery	52 (%17)
Reading health-related publications	
Never	252 (%84)
Rarely	24 (%8)
Sometimes	19 (%6)
Always	5 (%2)
Watching health-related television	
Never	100 (%33)
Rarely	92 (23,8)
Sometimes	92 (%31)
Always	37 (%12)
Participating health-related in a panel	
No	286 (%95)
Yes	14 (%5)
Having been examined by a physician in the last year	
None	104 (%35)
1-3 times	148 (%49)
4-8 times	48 (%16)
Use of medication non-physician in the last year	
No	276 (%92)
Yes	24 (%8)
Receiving medical treatment in the last year	
No	269 (%90)
More than one	31 (%10)

Table 2. Participants' Health Anxiety Inventory and Cyberchondria Severity Scale Cronbach's Alpha value and means (n: 387)

	M ± *SD*	Number of items	Cronbach's Alpha
Hypersensitivity to physical symptoms and anxiety	26.0 ± 6.3	14	0.759
Negative consequences of illness	7.7 ± 2.8	4	0.598
Health Anxiety Inventory	**33.8 ± 7.9**	**18**	**0.775**
Excessiveness	6.3 ± 4.4	3	0.950
Distress	5.8 ± 3.5	3	0.820
Reassurance-seeking	4.8 ± 2.8	3	0.702
Compulsion	3.6 ± 1.7	3	0.802
Cyberchondria Severity Scale	**20.7 ± 10.5**	**12**	**0.902**

Table 4. Relationship between the Health Anxiety Inventory and the Cyberchondria Severity Scale

	Hypersensitivity and anxiety to physical symptoms	Negative consequences of the disease	Health Anxiety Inventory
Excessiveness	r=0.265 *	r=0.309 *	r=0.330 *
Distress	r=0.302 *	r=0.309 *	r=0.359 *
Reassurance-seeking	r=0.354 *	r=0.275 *	r=0.388 *
Compulsion	r=0.321 *	r=0.142 **	r=0.311 *
Cyberchondria Severity Scale	r=0.367 *	r=0.338 *	r=0.422 *

r: Spearman's rho testi, * $p<0.001$ ** $p<0.05$

Table 5. Examining the causality between health anxiety and cyberchondria severity

	β	*se*	*zβ*	*t*	*p*	*95% Confidence Interval for β*	
						Min.	*Max.*
Model 1: Health Anxiety Inventory							
Constant	26.771	0.809		33.094	**0.000**	25.179	28.363
Cyberchondria Severity Scale	0.285	0.036	0.422	8.027	**0.000**	0.215	0.355
Model Significance: F=64.434; $p<0.001$; R^2=0.178							
	β	*se*	*zβ*	*t*	*p*	*95% Confidence Interval for β*	
						Min.	*Max.*
Model 2: Health Anxiety Inventory							
Constant	25.779	0.940		27.432	**0.000**	23.929	27.628
Excessiveness	0.134	0.132	0.085	1.014	0.311	-0.126	0.393
Distress	0.248	0.174	0.126	1.422	0.156	-0.095	0.591
Reassurance-seeking	0.464	0.181	0.187	2.561	**0.011**	0.107	0.821
Compulsion	0.645	0.250	0.155	2.576	**0.010**	0.152	1.138
Model Significance: F=17.733; $p<0.001$; R^2=0.194							

B=Unstandardized coefficient, Beta= Unstandardized coefficient

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