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# The Role of Anxiety Sensitivity, Intolerance of Uncertainty, and Obsessive-Compulsive Symptoms in the prediction of Cyberchondria

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**ABSTRACT**

Frequent search for health-related data on the internet that escalates anxiety experience is called cyberchondria. The aim of this study was to determine the role of anxiety sensitivity, intolerance of uncertainty and obsessive-compulsive symptoms in the prediction of cyberchondria. The study was performed on 177 students of Tabriz University, Tabriz, Iran. The samples were recruited using clustering sampling method. Data were collected using Cyberchondria Sensitivity Scale (CSS), Anxiety Sensitivity Index-Revised (ASIR), Maudsley Obsessive-Compulsive Inventory (MOCI), and Intolerance of Uncertainty Scale (IUS). According to the regression analysis, anxiety sensitivity, intolerance of uncertainty and obsessive-compulsive symptoms positively and significantly predicted cyberchondria. According to the results, the interpretation of physical sensations as dangers, uncertainty about the origin of these senses, and the feeling of responsibility and coercion to be sure about the health leads the individual to frequently search medical information through the Internet.

## INTRODUCTION

Parallel to the occurring advances in technology and information accessibility, there is a growing increase in the number of health-related searches on the Internet by individuals. People would usually prefer medical internet searches over face to face visits seemingly because they took it an easier way to know about their disease. They can ask any question without by not being ashamed of. It also lessens the probable burdens of costs. But the most positive aspect of the issue is their direct access to data that surmounts the communicative barriers with physicians and provides an active presence in discussions overdiagnosis, care, and treatment.

Advances in Information Technology (IT), however, have its own demerits. Cyberchondria or excessive or frequent medical internet surfing is of harming factors bringing distress and anxiety. Cyberchondria is recognized to be the perilous and uncontrolled product of civilization. Graham has dubbed cyberchondria as a viral phenomenon and Kohler named it a destructive virus (31).

Belling believes cyberchondria is a formal diagnosis but not a novel and distinguished psychological case. Keller, Padala, and Petty have implicitly equaled cyberchondria with hypochondria. It seems that cyberchondria is the 21stcentury equivalence of hypochondria. Hypochondriac patients nowadays, prefer to refer online database rather than medical textbooks or encyclopedias. Harding, Skritskaya, Doherty, and Fallon called cyberchondria the new border of disease anxiety (4, 22, 18).

Most cyberchondria definitions have emphasized the role of anxiety. White & Horvitz introduced cyberchondria as "illogical escalation in anxiety about common symptoms coming from a frequent online search about medical issues". Saying that cyberchondria is about health-related online search and not merely former encountering with online health-related issues. The shared concept of all these definitions is excessive internet search. This behavior is time-consuming and frequent and covers numerous topics and brings mind business (36).

In general, it can be said that cyberchondria means a comprehensive and frequent search of health-related topics on the internet that consequence in anxiety over health and escalates anxiety in the individual. It does not acquire a separate diagnosis but is classified under health anxiety or hypochondria.

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The definition distinguishes cyberchondria from common health-related topics online search originated by curiosity or the need for more information. These types of internet searches even taking place for frequent times cannot be dubbed as cyberchondria because cyberchondria escalates anxiety.

Anxiety in those people who search for health-related in-formation can be either increased or decreased. In case of an increase in anxiety, the either avoid further searches or look for more trusted and certain information by more frequent searches. Those people who entrapped in this circle experience more anxiety about health (31).

According to the findings of Norr, Carpon, and Schmidt, people who frequently visit medical websites experience higher levels of anxiety sensitivity. It can be said that oversensitivity to potential anxiety stimulants of body feelings propels an individual into more frequent health-related online searches (30). Anxiety sensitivity generally is known to fear from anxiety related feelings. It is comprised of three factors of physical anxiety (fear from body feelings), cognitive anxiety (fearing lack of control) and social anxiety (fearing observable social signs) (26). Anxiety sensitivity is stemmed in the beliefs that physical experienced signs bring physical, psychological and social harms to an individual (32).

Intolerance of uncertainty is a conditional feature that compromises a series of negative beliefs about uncertainty and its consequences and includes a tendency toward negative reactions at emotional, cognitive, and behavioral levels when faced with negative situations and events (7). Fergus and Bardeen suggested intolerance of uncertainty as an important predictor of escalated health anxiety and Fergus showed a relationship between the concept and cyberchondria (11, 13).

Searching health-related topics on the internet is an assuring behavioral task. A person tries to solicit distress caused by uncertainty about medical issues. This decrease in uncertainty is the core stimulant of health-related online search. People who are incapable of tolerating uncertainty and fear from unknown objects experience uncertainty as a severely distressing condition and use online search as a comforting mean to confront their distress. Then health-related internet searching escalates uncertainty and health anxiety. Those incapable of tolerating uncertainty become very anxious in vogue situations. Their tendency toward disastrous interpretations of health info is linked with their intolerance of uncertainty. Thus, people with more intolerance of uncertainty search internet about health topics more and more frequently and consequently increase their anxiety (11).

Obsessive-compulsive disorders (OCD) are characterized by obsessive and/or compulsive disorders. Obsessive disorders are those recrudescent and constant thoughts and imaginations experienced unintentionally while compulsive disorders are frequent mental or behavioral actions in which a person thinks he is obliged to do them according to his obsessions or other firm laws that must be followed strictly (2). McElroy and Shevlin believe that online search of medical topics in cyberchondria is stimulated with an obsessive factor and this search behavior halters individual's other activities (25).

According to Fergus, cyberchondria has a direct and significant relationship with obsessive signs. Two subscales of cleaning and checking compulsions have an adjacent relationship with cyberchondria. Regarding the close affinity between cyberchondria and health anxiety, frequent medical online searches to get ensured about one's health can escalate obsession about physical health and consequently results into more cleaning to eliminate pollution and prevent diseases. Escalated health-related mental obsessions bring more online searches. If cyberchondriac people believe that online medical checking compulsions decrease the probability of disastrous diseases then it would prevent the emergence of further future diseases (14). The findings of Norr, Oglesby, Raines, Macatee, Allan, and Schmidt showed that there was a positive and meaningful relationship between cyberchondria and obsession. They revealed that cleaning subscale had a unique relationship with all subscales of cyberchondria. Checking compulsion also had a strong relationship with cyberchondria but not as much as cleaning and cleaning (31).

Researchers believe that cyberchondria is a safety searching manner in which an individual is entrapped in a vicious circle of frequent online searches to decline his anxiety and be ensured of his wellbeing (3, 31). This safety searching demand final leads to the escalated obsessive symptoms. It can be said that cyberchondria as a safety searching reaction leads to the emergence or continuity of obsessive symptoms (10). online medical searches inside the discourse of cyberchondria act as a safety searching behavior that reduces the on moment anxiety or prevents from its future occurrence (19).

The findings of previous studies suggested that cyberchondria has a significant relationship with anxiety symptoms. These findings tried to separately scrutinize the relationship between cyberchondria and anxiety sensitivity, intolerance of uncertainty, and obsessive-compulsive symptoms. Due to the existing overlap between the above three variables, the present study tries to investigate the role of anxiety sensitivity, intolerance of uncertainty and obsessive-compulsive symptoms in escalating the probability of cyberchondria.

## METHODOLOGY

Statistical population, samples, and method: the present study is a correlational type of research. The studied population was comprised of students of Tabriz University, Tabriz; Iran. We selected 177 students (129 girls and 48 boys) using clustering sampling method. Data were analyzed by SPSS-22 software. To analyze results we used Enter regression method.

## ASSESSMENT TOOLS

### Anxiety Sensitivity Index-Revised (ASIR)

ASIR is a self-report questionnaire including 16 items in the form of a 5-point Likert scale (few to very much). Each item reflects the notion that anxiety is experienced undesirably and can lead to the harming consequences. Scoring range is 0- 64 (16). The questionnaire is compromised by 3 parts: fearing physical anxieties (8 items), fearing loss of cognitive control (4 items), and fearing anxiety observed by the others (4 items) (38). Studying psychometric properties of scale reveals its intrinsic stability (Alpha coefficient of 0.80 - 0.90). Retest

reliability of 0.75 after two weeks and 0.71 after 3 years shows that ASI is a stable personality structure (32). The reliability in its Iranian version is calculated by 3 methods of internal consistency, retest, and bisection that respectively obtained the ratios of 0.93, 0.95, and 0.97 for the whole scale. The validity was calculated utilizing three methods of concurrent validity, correlation of subscales with the whole and each other and factor analysis. The concurrent validity was done through the simultaneous administration of the tool with
SCL-90 questionnaire resulting in the correlation coefficient of 0.57. Obtained correlation coefficient with the total score was acceptable and varied between 0.74 -0.88 (27).

**Maudsley Obsessive-compulsive Inventory (MOCI)**

The inventory includes 30 items with a true/false format. It is specifically designed to assess OCD symptoms and acquires 4 subscales (cleaning, checking, slowness, and doubting) (20). Rachman and Hodgson and also Sternberger and Burns reported its reliability coefficient to be 0.89 using retest method (23). Dadfar also reported reliability coefficient for the whole scale to be 0.84 and its convergence validity with Yale Brown Obsessive-compulsive scale (Y-BOCS) to be 0.87 (24).

**Intolerance of Uncertainty Scale (IUS)**

It was the first test to evaluate intolerance of uncertainty designed by Freeston, Rheaume, Letarte, Dugas, and Ladouceur. The scale includes 27 items and is in the form of 5-points Likert scale (never, seldom, sometimes, usually, and often) (17). Cronbach's Alpha coefficient and testretest validity are respectively 0.94 and 0.74 for the scale (7, 8). Carleton, Norton, and Asmundson designed a short form of the questionnaire including 12 items (9). The short form has an appropriate correlation with the original version ($P<0.001$, $r= 0.96$). The common version includes two parts about prospective anxiety and inhibitory anxiety. Prospective anxiety points to the approach oriented responses and has 7 items which assess an individual's tendency to predict and search actively the information to decrease uncertainty and know about future events. Inhibitory anxiety assesses inhibitory oriented responses to uncertainty and includes 5 items. This part evaluates the level of continence when facing uncertainty (5).

**Cyberchondria Severity Scale (CSS)**

CSS is a self-report scale containing 33 items and deals with behaviors about health-related online searches. The scale has a Likert format and asks participants to read sentences and select the degree to which each sentence is applicable to them (never, seldom, sometimes, usually, and often). The total internal consistency was calculated to be 0.91 and for the subscales of compulsion, excessiveness, reassurance, distress, and mistrust, the reliability coefficient was calculated to be respectively 0.87, 0,79, 0.83, 0.87, and 0.62 (21).

## FINDINGS

Descriptive data for research variables are presented in Table 1. Three subscales of anxiety sensitivity are classified under social anxiety, cognitive anxiety, and physical anxiety. Intolerance of uncertainty is also depicted as two subscales of prospective intolerance of uncertainty and inhibitory in- tolerance of uncertainty. OCD variable is also presented as four subscales of checking compulsion, cleaning compulsion, slowness, and doubting.

The correlation coefficient of variables of cyberchondria, anxiety sensitivity, intolerance of uncertainty and OCD are presented in Table 2. As it is illustrated there is a positive and significant correlation between subscales of social anxiety, cognitive anxiety, prospective intolerance of uncertainty,

**Table 1.** Descriptive indexes of research variables

| Variable | Mean | SD |
|---|---|---|
| Cyberchondria | 72.65 | 19.95 |
| Social anxiety | 8.45 | 2.52 |
| Cognitive anxiety | 5.60 | 3.45 |
| Physical anxiety | 13.02 | 4.31 |
| Prospective intolerance of uncertainty | 16.54 | 4.65 |
| Inhibitory intolerance of uncertainty | 14.23 | 3.81 |
| Checking | 3.90 | 2.08 |
| Cleaning | 8.54 | 0.76 |
| Slowness | 4.97 | 1.12 |
| Doubting | 3.62 | 1.35 |

**Table 2.** Matrix of correlation coefficients of studied variables

| Variable | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| Cyberchondria | 1 | | | | | | | | | |
| Social anxiety | 0.17* | 1 | | | | | | | | |
| Cognitive anxiety | 0.38** | 0.42** | 1 | | | | | | | |
| Physical anxiety | 0.37** | 0.37** | 0.62** | 1 | | | | | | |
| Prospective intolerance of uncertainty | 0.34** | 0.34** | 0.51** | 0.38** | 1 | | | | | |
| Inhibitory intolerance of uncertainty | 0.39** | 0.25** | 0.40** | 0.31** | 0.66** | 1 | | | | |
| Checking | 0.40** | 0.17** | 0.37** | 0.21** | 0.40** | 0.28** | 1 | | | |
| Cleaning | 0.28** | 0.12 | 0.24** | 0.20** | 0.31** | 0.26** | 0.44** | 1 | | |
| Slowness | 0.27** | 0.14 | 0.32** | 0.23** | 0.25** | 0.19* | 0.71** | 0.43** | 1 | |
| Doubting | 0.40** | 0.21** | 0.39** | 0.33** | 0.45** | 0.29** | 0.39** | 0.39** | 0.28** | 1 |

*(P<0.05), ** (P<0.01)

inhibitory intolerance of uncertainty, checking, cleaning, slowness, and doubting in one hand and cyberchondria symptoms on the other hand.

To evaluate the combined share of anxiety sensitivity, intolerance of uncertainty, and OCD in the prognosis of cyberchondria symptoms we utilized multiple regression. Obtained results are depicted in Table 3. As illustrated, the regression of cyberchondria scores toward prognostic variables is statistically significant (P<0.0001, f = 9.46). It can be said that, as suggested by results, social anxiety, cognitive anxiety, physical anxiety, prospective intolerance of uncertainty, inhibitory intolerance of uncertainty, checking, cleaning, slowness, and doubting can predict cyberchondria symptoms in a combined and significant way. The prognostic coefficient also showed that 33% of the variance in cyberchondria symptoms is demonstrated by social anxiety, cognitive anxiety, physical anxiety, prospective intolerance of uncertainty, inhibitory intolerance of uncertainty, checking, cleaning, slowness, and doubting. Based on the provided data by the table and also the data of beta coefficient it can be said that the subscales of physical anxiety, inhibitory intolerance of uncertainty, checking, and doubting with the respectively beta coefficients of 0.19, 0.26, 0.28, and 0.19 predicted the changes in cyberchondria symptoms in a meaningful way.

## DISCUSSION

Most people more often do an online search concerning their health. But some do the same action with more anxiety which is called cyberchondria (34). Cyberchondria is a multi-dimensional procedure that covers excessive online searches (excessiveness), behavioral interference with other activities due to online searches (compulsion), anxiety caused by online searches (distress), and asking assurance from health experts due to inadequate data provided by online searches (reassurance) (33).

Presently, we have insufficient knowledge about the fundamental reasons behind cyberchondria. The aim of the present investigation is to clarify underlying factors that cause cyberchondria. The results suggest obsessive-compulsive symptoms, anxiety sensitivity, and intolerance of uncertainty are the strong predictors of cyberchondria. These findings are in the line with the previous studies. Abramowitz, Olatunji, and Deacon showed that anxiety sensitivity has a positive and significant relationship with health anxiety (1).

People with higher anxiety sensitivity interpreted anxiety-related physical emotions to be dangerous that probably made to do online searches to be ensured about their health. The present study is also in the line with that of Baumgartner, Hartman, and also Muse, McManus, Leung, Meghreblian, and Williams suggesting that anxiety sensitivity has a positive and significant relationship with cyberchondria (3, 28).

Intolerance of uncertainty was another affecting factor on cyberchondria in the present study. This finding was in agreement with the studies of Fergus, Bardeen, and Fetzner that suggested a positive relationship between cyberchondria and intolerance of uncertainty (11, 15). Fergus con-firmed the mediating role of intolerance of uncertainty in escalating severity of online searches and anxiety (13). The present findings also showed that inhibitory intolerance of uncertainty has a significant relationship with cyberchondria but it is not significant in case of intolerance of prospective cyberchondria (29). As Fergus believed people incapable of tolerating uncertainty especially inhibitory type, experience higher levels of cyberchondria (13). Due to the fact that there is uncertainty about the source of physical feelings people who are more capable of tolerating inhibitory uncertainty do more online searches to decrease the level of their uncertainty and experience less anxiety. However, their anxiety doesn't decrease because these online searches never end up with assuring answers and provide different explanations to a single symptom. It makes the search to be continued and the vicious circle of searching and anxiety goes on (36). People who have less tolerance for uncertainty, experience more anxiety when they do an online medical search (35). Intolerance of failure through disastrous interpretation of medical problems (12) is related to overestimation of negative consequences (6). People who are incapable of tolerating uncertainty usually make a falsified and catastrophic interpretation about medical explanation provided on the internet

**Table 3.** Regression analysis in predicting cyberchondria symptoms

| Predictors | Nonstandard coefficient | Estimation error | Beta | t | Level of significance | $R^2$ | F | Level of significance |
|---|---|---|---|---|---|---|---|---|
| Fixed | 32.42 | 15.69 | | 2.06 | 0.04 | | | |
| Social anxiety | -0.29 | 0.56 | -0.03 | -0.52 | 0.603 | | | |
| Cognitive anxiety | 0.38 | 0.53 | 0.06 | 0.71 | 0.474 | | | |
| Physical anxiety | 0.61 | 0.26 | 0.19 | 2.31 | 0.022 | | | |
| Prospective intolerance of uncertainty | -0.50 | 0.41 | -0.11 | -1.21 | 0.225 | 0.33 | 9.406 | 0.0001 |
| Inhibitory intolerance of uncertainty | 1.37 | 0.44 | 0.26 | 3.08 | 0.002 | | | |
| Checking | 2.76 | 0.94 | 0.28 | 2.93 | 0.004 | | | |
| Cleaning | 0.90 | 1.96 | 0.03 | 0.46 | 0.646 | | | |
| Slowness | -1.46 | 1.65 | -0.08 | -0.88 | 0.376 | | | |
| Doubting | 2.81 | 1.23 | 0.19 | 2.51 | 0.013 | | | |

and search more to get assured of their health. These efforts make individuals more and more anxious.

According to the findings of Fergus, there is a positive relationship between OCD symptoms and all dimensions of cyberchondria (14). Two dimensions have more specific relation namely checking and cleaning compulsions. Considering the strong relationship between cyberchondria and health anxiety it can be said that frequent health-related online searches escalate health-related obsession and increase the number of online searches to access medical information. If cyberchondriac people believe that online medical search would lessen catastrophic diseases then they obliged themselves to check more and carry out frequent online searches. Helbiglung and Peterman believed that getting assured is the most reliable type of safety behaviors and in its absence anxiety is increased that results in more online medical searches. As mentioned earlier this creates a vicious circle and makes individual to be entrapped in cyberchondriac situation (19). Norr et al. showed that cleaning symptoms are totally correlated with all dimensions of cyberchondria and checking is also correlated with all facets of cyberchondria except reassurance. Deacon and Mac also showed that safety searching behaviors escalate OCD symptoms. Safety searching behavior of online medical search is utilized by those people with checking and cleaning symptoms to lessen health-related distress and anxiety (10).

Cyberchondria is a novel phenomenon. By standing upon the findings of the present investigation one can have better insight into the phenomenon and the affecting fundamental factors that prevent cyberchondria. Anxiety sensitivity, intolerance of uncertainty and obsessive-compulsive symptoms are highlighted to be the predictors of cyberchondria. Of the limitations in the present study notably are self-report assessing tools and the sample all were students. Further investigations can be fruitful in the identification of other effective mediators on cyberchondria.

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