Sleep Hypn. 2018 Dec;20(4):241-246
http://dx.doi.org/10.5350/Sleep.Hypn.2018.20.0157

Sleep and Hypnosis
A Journal of Clinical Neuroscience and Psychopathology

ORIGINAL ARTICLE

The Cyberchondria Severity Scale (CSS): Validity and Reliability Study of the Turkish Version

Yavuz Selvi[1*], Seda Gokce Turan[2], Ayca Asena Sayin[3], Murat Boysan[4], Ali Kandeger[5]

[1]Department of Psychiatry, Faculty of Medicine, Selcuk University, Konya, Turkey
[2]Department of Child Care and Young Services, Vocational School of Health Services, Bahcesehir University, Istanbul, Turkey
[3]Department of Psychiatry, Duzici State Hospital, Osmaniye, Turkey
[4]Department of Psychology, Faculty of Science and Arts, Yuzuncu Yil University, Van, Turkey
[5]Department of Psychiatry, Isparta City Hospital, Isparta, Turkey

ABSTRACT
Objective: Even though the internet is a valuable resource for medical information, it has the potential to increase anxiety, fear or obsessive-compulsive behaviours, particularly among individuals more prone to health related anxiety. Researchers have found that health anxiety, hypochondria, and online health searches are associated with increased anxious symptomatology. The aim of this study is to investigate the psychometric properties of the Turkish version of the Cyberchondria Severity Scale, a measure of online health anxiety.
Method: Three hundred thirty-seven university students with an age range of 16-55 were included in the study. The Cyberchondria Severity Scale (CSS), Internet Addiction Test (IAT), Anxiety Sensitivity Inventory-3 (ASI-3), and Health Anxiety Inventory (HAI) were administered to participants.
Results: Confirmatory factor analysis revealed that five-factor solution best fit to the data. The overall and subscales of the CSS had excellent internal consistency (Cronbach α = 0.91, for the overall measure, and Cronbach α values ranged from 0.78 to 0.87), with an exception of 'mistruct of medical professional' subscale (Cronbach α = 0.64). The total and subscales of the CSS had generally good convergent validity.
Conclusion: The CSS is a newly developed screening tool to assess online health anxiety, and present study demonstrated that the Turkish version of the scale had promising psychometric properties.
Keywords: cyberchondria, health anxiety, scale, Turkish, validitation

INTRODUCTION

As many researcher points out that the internet changes not only people's communication, feelings or behaviours but also their lifestyles (Deetjen, 2017; Lewis, 2006). Not only does the internet reshape lifestyles or feelings of people toward themselves or their bodies, but also it moulds perception of medical symptoms with its omnipresent delivery mechanism for medical research (Aiken & Kirwan, 2012; Starcevic & Aboujaoude, 2015).

Although the internet is a valuable source for medical information, it has potential to increase anxiety, fear or obsessive- compulsive behaviours, especially for people susceptible to health anxiety (Aiken, Kirwan, Berry, & O'Boyle, 2012; Norr, Albanese, Oglesby, Allan, & Schmidt, 2015). Researchers noted that there is correlation between health anxiety and hypochondria, and also online searches in regard to health related subjects may induce fear and anxiety (Aiken et al., 2012). Such linkages have lead to an conceptualization of the term

***Correspondence:** dryavuzselvi@yahoo.com
Yavuz Selvi, M.D., Associate Professor of Psychiatry, Department of Psychiatry, Faculty of Medicine, Selcuk University, 42250, Selcuklu, Konya, Turkey, Tel: +903322244563
Received: 17 October 2017 **Accepted:** 24 November 2017

Sleep and Hypnosis
Journal homepage:
www.sleepandhypnosis.org
ISSN:1302-1192 (Print) 2458-9101 (Online)

"cyberchondria" referring to an escalation of concerns about mental or physical symptomatology dependent on review of search results and literature online (Starcevic & Berle, 2013; White & Horvitz, 2009).

Seeking health information on the internet may have both positive and negative effects on people. Doing more exercises, gaining healthier eating habits, or adherence to medication can be considered as positive outcomes emerge from health-related online experiences (McElroy & Shevlin, 2014). On the contrary, such strivings may give rise to inflated uncertainty about ailments due to the concerns about accuracy, relevance and reliability of information based on online search results. Individuals more susceptible to intolerance of uncertainty are potentially more receptive to online health anxiety (Starcevic & Aboujaoude, 2015). Moreover, Norr et al. suggested that anxiety sensitivity and intolerance of uncertainty are potential risk factors for cyberchondria (Norr, Albanese, Oglesby, Allan, & Schmidt, 2015).

Cyberchondria is a type of elevated anxiety concerning distress about one's own health status due to the online search for health information (McElroy & Shevlin, 2014). The conceptualization captures reassurance-seeking behaviours in which the priority of the afflicted individuals appears to be relief from health anxiety without any interaction with people suffering from similar problems (Starcevic & Aboujaoude, 2015). Most importantly, increased health anxiety in response to the online health related information is the hallmark of cyberchondria. The process occurs reciprocally that individuals who spent more time seeking health related content experience excessive distress that in turn provokes more online search for relief (Norr, Albanese, Oglesby, Allan, & Schmidt, 2015).

The CSS was developed as a self-report psychometric instrument by McElroy and Shevlin to measure the experienced health anxiety in the face of excessive online health search (McElroy & Shevlin, 2014). The CSS consisting of 33 items yields five subscales of 'Compulsion', 'Distress', 'Excessiveness', 'Reassurance Seeking' and 'Mistrust of Medical Professional'. The CSS was demonstrated to have good psychometric properties with excellent internal reliability (Cronbach alphas ranged from 0.75 to 0.95). Subsequently, a five-factor solution was replicated in the verification study of the community sample (Fergus, 2014). However, Norr et al. argue that orthogonal general factor with four subfactors is the best model and that "Mistrust of Medical Professionals" does not belong to the structure of the cybercondria (Norr, Allan, Boffa, Raines, & Schmidt, 2015). Finally, in the German validation study, the internal consistency of the scale was found to be α= .93 and split-half reliability to be α= .95. The 'Mistrust of Medical Professional' subscale had relatively low internal reliability (α = .74) similar in the initial validation even if it was acceptable (Barke, Bleichhardt, Rief, & Doering, 2016).

In addition, these studies have shown that anxiety sensitivity, health anxiety and problematic internet use are risk factors for ciberchondria (Fergus & Dolan, 2014; Fergus & Spada, 2017). It has also been shown that ciberchondria potential overlaps with obsessive compulsive symptoms (Fergus & Russell, 2016).

The main purpose of this study is to investigate the reliability and validity of the Turkish version of the CSS, which was developed to measure pathological online health anxiety. In order to investigate further its validity, we assessed health anxiety, anxiety sensitivity, and internet addiction.

METHOD

Participants and Procedure

Participants were 337 university students, aged 16 to 55. Mean age of the sample was 21.76 (SD± 5.21). Approximately half of the sample was women (N=188, 55.79%). The study procedure was approved by Selcuk University Ethical Committee. Each participant provided informed written consent after a description of aims and procedure of the present study. Volunteers were not compensated for their participation.

The CSS was translated from English to Turkish by two translators. Three academicians fluent in English commented on the translated questionnaire form of the CSS in terms of content appropriateness and cultural correspondence. Finally, the translated versions were combined after having a consensus on the items.

Psychometric Measures

Cyberchondria Severity Scale (CSS)

The CSS is a 33-item self-report measure designed to assess cyberchondria. The CSS items are rated on a 5-point scale (ranging from 1 to 5). In addition to a total score, the CSS consists of five subscales: Compulsion (8 items), Distress (8 items), Excessiveness (8 items), Reassurance (6 items), and Mistrust of Medical Professional (3 items) (McElroy & Shevlin, 2014).

Internet Addiction Test (IAT)

The IAT was developed by Young to assess presence and severity of pathological internet use symptoms (Young, 1998). The scale consists of 20 self-report items rated on a 6-point Likert type scale ranging from 0 to 5. The Turkish version of the screening tool was demonstrated to have good reliability and validity, with a Cronbach alpha of 0.93 (Boysan et al., 2017).

Anxiety Sensitivity Inventory-3 (ASI-3)

The ASI-3 was developed by Taylor et al. in order to evaluate a tendency to experience health-related anxiety sensitivity (Taylor et al., 2007). The ASI-3 consisting of three subscales (physical, cognitive and social) and a total of 18 items were also tested for validity and reliability in our country (Mantar, Yemez, & Alkin, 2010).

Health Anxiety Inventory (HAI)

The HAI contains 18 items that assess health anxiety independently of physical health status. Items assess worry about health, awareness of bodily sensations or changes, and feared consequences of having an illness. The SHAI has demonstrated good reliability, criterion validity, and sensitivity to treatment (Salkovskis, Rimes, Warwick, & Clark, 2002). The Turkish version of the HAI used in this study has been validated in Turkish populations (Aydemir, Kirpinar, Tülay, Uykur, & Cengisiz, 2013).

Statistical Analysis

At the outset, we computed descriptive statistics for the sample using SPSS. Using LISREL, we ran a Satorra–Bentler corrected maximum likelihood confirmatory factor analysis to test the fit of the original five-factor structure for the CSS. The goodness-of-fit indexes obtained for the specified model and expected values according to the guidelines (Hu & Bentler, 1999; Kline, 2010) are as follows: the root-mean-square error of approximation (RMSEA ≤ 0.08), the comparative fit index (CFI ≥ 0.90), Tucker–Lewis index (TLI ≥ 0.90), and standardized root mean square residual (SRMR ≤ 0.10).

Internal consistency, corrected item-total correlations, Spearman inter-item correlations, means, standard deviations, item means range, and item standard deviations range for the psychometric measures were computed. Factor correlations of the CSS, and Pearson product-moments correlation coefficients between screening tools were run.

RESULTS

Confirmatory factor analysis (CFA) for the Cyberchondria Severity Scale

We ran a Satorra-Bentler corrected maximum likelihood CFA for to investigate the validity of the original five-factor structure of the CSS on the data collected from 337 Turkish college students. CFA goodness-of-fit indices for the original five-factor solution fell within an acceptable range: Satorra-Bentler Scaled χ^2 was 1884.19 ($P < 0.001$), Tucker-Lewis Index (TLI) was 0.90, Comparative Fit Index (CFI) was 0.91, and standardized root mean square of residuals (SRMR) was 0.092. All items of the CSS loaded moderately to strongly on to the respective factors (0.42 to 0.80). Item loadings are reported in Table 1.

Table 2 presents descriptive statistics for the screening tools. Excellent corrected item total correlation coefficients were computed for the subscales of the CSS (≥0.33). The overall and sub-scales of the CSS had excellent internal consistency (α = 0.91 for overall 33 items and Cronbach alphas ranging from 0.78 to 0.87) with an exception of mistrust of medical professional scale that was relatively low (α = 0.64).

Table 3 presents the factor correlations of the CSS. Weak to strong positive correlations were obtained between each of the five factors. All the factor correlations

were statistically significant (*p<0.01*) with an exception of the association between Compulsions and mistrust of medical professional.

As given in Table 4, Pearson product-moments correlation coefficients within five factors were strong and statistically significant. Weak to moderate associations of the Health Anxiety Inventory scores with total and subscale scores of the CSS were obtained in which

Table 1. Maximum likelihood estimates of the item factor loadings

Items	Compulsions	Distress	Excessiveness	Reassurance	Mistrust of medical professional
1			0.69		
2			0.73		
3	0.68				
4				0.58	
5		0.63			
6	0.69				
7		0.60			
8	0.52				
9					0.49
10		0.55			
11			0.67		
12	0.80				
13			0.72		
14	0.67				
15				0.60	
16				0.56	
17	0.72				
18			0.67		
19			0.42		
20		0.53			
21			0.42		
22		0.64			
23		0.69			
24	0.71				
25	0.68				
26				0.66	
27				0.68	
28					0.75
29		0.54			
30			0.54		
31		0.66			
32				0.55	
33					0.64

Table 2. Descriptive and item statistics for the measures

	α	Rjt	Inter-item r	M	SD	M range (items)	SD range (items)	Score range
Cyberchondria Severity Scale	0.91	0.17-0.63	-0.13-0.77	75.47	19.41	1.56-3.47	0.77-1.57	33-165
Compulsions	0.87	0.47-0.74	0.28-0.62	13.24	5.02	1.54-1.86	0.78-1.05	8-40
Distress	0.83	0.50-0.62	0.25-0.56	16.50	5.61	1.61-2.56	0.92-1.19	8-40
Excessiveness	0.84	0.33-0.73	0.12-0.79	21.17	6.79	2.05-3.17	1.10-1.40	8-40
Reassurance	0.78	0.43-0.63	0.25-0.55	14.33	5.04	1.88-2.71	1.00-1.39	6-30
Mistrust of medical professional	0.64	0.37-0.57	0.22-0.48	10.23	3.49	3.38-3.44	1.49-1.56	3-15
Internet Addiction Test	0.89	0.28-0.68	0.04-0.059	27.84	13.88	0.82-2.64	0.91-1.49	0-100
Anxiety Sensitivity Inventory	0.89	0.23-0.60	-0.01-0.66	24.16	12.10	0.76-1.99	1.00-1.26	0-72
Health Anxiety Inventory	0.81	0.24-0.52	0.04-0.45	15.55	6.79	0.46-1.43	0.63-0.92	0-54

Note. N = 337; α= internal consistency; Rjt= corrected item-total correlations (range); inter-item r= Spearman inter-item correlations (range); M= mean; SD= standard deviation; M range (items)= item means (range); SD range (items)= item standard deviations (range);

Table 3. Factor correlations of the CSS

Items	1	2	3	4	5
1.Compulsions	1.00				
2.Distress	0.80	1.00			
3.Excessiveness	0.53	0.67	1.00		
4.Reassurance	0.53	0.66	0.78	1.00	
5.Mistrust of medical professional	-0.05	0.17	0.32	0.44	1.00

Table 4. Pearson product-moments correlation coefficients

	1	2	3	4	5	6	7	8	9
1. Cyberchondria Severity Scale	1,00								
2. Compulsion	,72 **	1,00							
3. Distress	,82 **	,65 **	1,00						
4. Excessiveness	,83 **	,43 **	,55 **	1,00					
5. Reassurance	,82 **	,46 **	,55 **	,61 **	1,00				
6. Mistrust of medical professional	,41 **	,00	,17 **	,26 **	,35 **	1,00			
7. Internet Addiction Test	,45 **	,40 **	,43 **	,43 **	,34 **	-,07	1,00	,	
8. Anxiety Sensitivity Inventory	,39 **	,35 **	,40 **	,33 **	,25 **	,02	,31 **	1,00	
9. Health Anxiety Inventory	,23 **	,21 **	,32 **	,19 **	,07	,01	,13 *	,38 **	1,00

*Note. *:p<0.05; **:p<0.01*

reassurance and mistrust of medical professional were not significant correlates of health anxiety. Internet Addiction Test and Anxiety Sensitivity Inventory scores generally indicated significant associations with total and subscale scores of the CSS. Conversely, mistrust of medical professional subscale was not associated with the internet addiction and anxiety sensitivity.

DISCUSSION

As noted by many research so far, the internet and social media have crucial influences on people's life styles not only socially but also in medical issues. As the interest in the internet resources grows rapidly, people seem to be at greater risk for experiencing health anxiety based on the unreliable information obtained from online search results, particularly cyberchondria (Starcevic, 2017).

The CSS developed by McElroy and Shelvin, is expected to be an important tool in assessment of the severity of cyberchondria and its associations with psychiatric disorders (McElroy & Shevlin, 2014). The aim of the study was to explore reliability and validity of the Turkish version of the CSS which developed for the measure consequences of excessive health-related online search.

According to the results of the current study excellent corrected item total correlation coefficients were computed for the subscales of the CSS. The overall and sub-scales of the CSS had excellent internal consistency (α = 0.91 for overall 33 items and Cronbach alphas ranging from 0.78 to 0.87) with an exception of Mistrust of Medical Professional scale that was relatively low (α = 0.64). According to these results CSS is reliable and validity scale for assessing cyberchondria severity. Previous studies that examined the psychometric properties of CSS reported that the "mistruct of medical professional" subscale had a relatively low internal consistency and should be removed from the scale (Fergus, 2014; Norr, Allan, et al., 2015). Our results showed acceptable internal consistency, although consistent with these studies. As a result, there is a need to study more in a larger sample of the psychometric properties of the CSS.

The current study investigated also correlations between subscales of cyberchondria and internet addiction, anxiety sensitivity and health anxiety. In previous studies, anxiety sensitivity, health anxiety and internet addiction were found to be risk factors for cyberchondria (Norr, Albanese, Oglesby, Allan, & Schmidt, 2015; Fergus & Spada, 2017; White & Horvitz,

2009). Supporting for hypothesis of this study anxiety sensitivity, health anxiety and internet addiction are highly correlated with cyberchondria severity. In order to assess and give support to people about cyberchondria we believe that firstly internet addiction and anxiety levels of individuals should be controlled. Because they are the most important factors that pose greater risk for cyberchondria.

As a result, the Turkish version of the CSS showed promising psychometric properties among healthy university students. The CSS is thought to be one of the useful tools for assessing the severity of cyberchondria and its relation to psychiatric disorders. Despite these positive results, further study is needed to evaluate the psychometric properties of CSS with a large sample size.

Declaration of Conflicting Interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The authors received no financial support for the research, authorship, and/or publication of this article.

References

Aiken, M., & Kirwan, G. (2012). *Prognoses for diagnoses: medical search online and "cyberchondria"*. Paper presented at the BMC Proceedings.

Aiken, M., Kirwan, G., Berry, M., & O'Boyle, C. A. (2012). The age of cyberchondria.

Aydemir, Ö., Kirpinar, I., Tülay, S., Uykur, B., & Cengisiz, C. (2013). Reliability and validity of the Turkish Version of the Health Anxiety Inventory. *Nöro Psikiyatri Arşivi, 50*(4), 325.

Barke, A., Bleichhardt, G., Rief, W., & Doering, B. K. (2016). The cyberchondria severity scale (CSS): German validation and development of a short form. *International journal of behavioral medicine, 23*(5), 595-605.

Boysan, M., Kuss, D. J., Barut, Y., Ayköse, N., Güleç, M., & Özdemir, O. (2017). Psychometric properties of the Turkish version of the Internet Addiction Test (IAT). *Addictive behaviors, 64*, 247-252.

Deetjen, U. (2017). The lifestyle paradox: adverse effects of Internet use on self-rated health status. *Information, Communication & Society*, 1-15.

Fergus, T. A. (2014). The Cyberchondria Severity Scale (CSS): an examination of structure and relations with health anxiety in a community sample. *Journal of anxiety disorders, 28*(6), 504-510.

Fergus, T. A., & Dolan, S. L. (2014). Problematic internet use and internet searches for medical information: the role of health anxiety. *Cyberpsychology, Behavior, and Social Networking, 17*(12), 761-765.

Fergus, T. A., & Russell, L. H. (2016). Does cyberchondria overlap with health anxiety and obsessive–compulsive symptoms? An examination of latent structure and scale interrelations. *Journal of anxiety disorders, 38*, 88-94.

Fergus, T. A., & Spada, M. M. (2017). Cyberchondria: Examining relations with problematic Internet use and metacognitive beliefs. *Clinical Psychology & Psychotherapy*.

Hu, L. t., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural equation modeling: a multidisciplinary journal, 6*(1), 1-55.

Kline, R. (2010). Principles and Practice of Structural Equation Modeling, 3rd edn Guilford Press. *New York, USA*.

Lewis, T. (2006). Seeking health information on the internet: lifestyle choice or bad attack of cyberchondria? *Media, Culture & Society, 28*(4), 521-539.

Mantar, A., Yemez, B., & Alkin, T. (2010). The validity and reliability of the Turkish version of the anxiety sensitivity index-3. *Turk Psikiyatri Dergisi, 21*(3), 1.

McElroy, E., & Shevlin, M. (2014). The development and initial validation of the cyberchondria severity scale (CSS). *Journal of anxiety disorders, 28*(2), 259-265.

Norr, A. M., Albanese, B. J., Oglesby, M. E., Allan, N. P., & Schmidt, N. B. (2015). Anxiety sensitivity and intolerance of uncertainty as potential risk factors for cyberchondria. *Journal of Affective Disorders, 174*, 64-69.

Norr, A. M., Allan, N. P., Boffa, J. W., Raines, A. M., & Schmidt, N. B. (2015). Validation of the Cyberchondria Severity Scale (CSS): replication and extension with bifactor modeling. *Journal of anxiety disorders, 31*, 58-64.

Salkovskis, P. M., Rimes, K. A., Warwick, H., & Clark, D. (2002). The Health Anxiety Inventory: development and validation of scales for the measurement of health anxiety and hypochondriasis. *Psychological medicine, 32*(5), 843-853.

Starcevic, V. (2017). Cyberchondria: Challenges of Problematic Online Searches for Health-Related Information. *Psychotherapy and Psychosomatics, 86*(3), 129-133.

Starcevic, V., & Aboujaoude, E. (2015). Cyberchondria, cyberbullying, cybersuicide, cybersex:"new" psychopathologies for the 21st century? *World Psychiatry, 14*(1), 97-100.

Starcevic, V., & Berle, D. (2013). Cyberchondria: towards a better understanding of excessive health-related Internet use. *Expert Review of Neurotherapeutics, 13*(2), 205-213.

Taylor, S., Zvolensky, M. J., Cox, B. J., Deacon, B., Heimberg, R. G., Ledley, D. R., . . . Stewart, S. H. (2007). Robust dimensions of anxiety sensitivity: development and initial validation of the Anxiety Sensitivity Index-3. *Psychological assessment, 19*(2), 176.

White, R. W., & Horvitz, E. (2009). Cyberchondria: studies of the escalation of medical concerns in web search. *ACM Transactions on Information Systems (TOIS), 27*(4), 23.

Young, K. S. (1998). *Caught in the net: How to recognize the signs of internet addiction--and a winning strategy for recovery*: John Wiley & Sons.