Validating a Saudi version of the short form of the Cyberchondria Severity Scale (CSS-12):

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Abstract: The aim of the present study was to develop the Saudi version of the CSS-12 and test its psychometric properties. A community sample of 200 Arabic -speaking adults (55% women; mean age = 26.3535 ± 8.17240 years) completed the Arabic translation of CSS-12 along with measures of health anxiety, obsessive-compulsive, anxiety and depressive symptoms. The Saudi version of the CSS-12):was found to be a self rating scale with good psychometric characteristics which measures what it claims to measure. validity calculated in several ways such as: content validity, internal construction, & Construct validity with two different kinds : concurrent validity (By finding the correlation with the scale of positive components of classroom environment), & factorial validity. Reliability calculated using Cronbach's alpha equation & half-spilt method.

The results showed that the instrument has good psychometric characteristics. The 12-item (CSS-12)is a stable, concise, and validated tool to measure Cyberchondria Severity. It is applicable for Saudi community adults in nonspecific stressful settings and has potential utility in the health care domain.

Keywords: Cyberchondria Severity Scale (CSS-12):; Validating

1−Introduction:

The internet has rapidly become the general public's primary source of health related information. Convenient and low-cost access to health information undoubtedly offers numerous advantages, including improved health literacy and the ability to make empowered health decisions.1-3 However, there may also be drawbacks to consider when dealing with such an abundance of largely unregulated information. For example, a nationally representative survey of adults in the United States found that 35% of respondents had used the internet to self-diagnose a medical condition within the previous year.4 Self-diagnosis is a crude process that is often based on ambiguous and conflicting information). The concept of Cyberchondria refers to excessive and repeated online health-related searching, which is associated with increased distress and anxiety (Mubeen, 2019, Marino et al.,2020, Fergus, 2013).

In addition, Cyberchondria refer to painful, problematic behavior where a person takes too much time. It may lead to functional impairment and increased use of healthcare. Previously a health concern ((Mubeen, 2019).

Internet searches triggered by a feeling of uncertainty and the continuation of these searches until a (transient) sense of reassurance is obtained also suggest possible links between cyberchondria, uncertainty and obsessive-compulsive symptoms (OCD). These relationships have been demonstrated in previous studies (Fergus, 2013; Fergus et al., 2016).

It is noteworthy that increasing availability of medical information on the Internet may help empower people and patients with medical knowledge and information. However, information about health on the Internet varies greatly in terms of accuracy and is not usually adapted to the needs of users. Especially since non-health science professionals have little experience and tools to evaluate the accuracy and reliability of this complex health information. Regardless of the potential benefits of the patient-physician relationship and shared decision-making processes, it is uncommon for non-professionals to discuss health information derived from the Internet.

In this context, studies (Fergus & Dolan, 2014, Doherty et al., 2016) have shown that searching for health information may increase levels of anxiety and uncertainty about the feared situation in about a third of users, particularly in those who suffer from anxiety as well. The study of Baumgartner & Hartmann, 2011).

People who are concerned about their health search the Internet for health purposes more frequently and for longer periods of time than othersAmbiguous, conflicting, or insufficient information may result in Internet access leads to increased uncertainty and distress during and after Internet searches, which leads to a further increase in search behavior in an attempt to obtain reassurance, as studies (Fergus, 2013, White & Horvitz, 2009,) showed that the pursuit of reassurance contributes in turn to increased anxiety. The increased anxiety stemming from excessive or frequent health-related internet searches is often termed cyberchondria (McElroy & Shevlin, 2014).

While only a limited number of studies have investigated the relationship between cyberchondria and anxiety and depressive symptoms, Barke et al. (2016) found moderately strong correlations between scores on the Cyberchondria Severity Scale (CSS) and measures of depressive symptoms.

Cyberchondria also appears to have compulsive traits. The behavior persists despite its negative effects, such as lengthy searches, increased distress, neglect of obligations, conflicts with others, difficulties with healthcare providers, and increased use of health services. This continuity in the face of negative consequences suggests a possible connection to compulsive behaviors. In addition, these studies have shown that cyberchondria can negatively affect your mental health. Cyberchondria can make the web a potentially dangerous and expensive place for health information seekers (White & Horvitz, 2009).

Through the discussion on cyberchondria and its negative effects, several studies have examined the psychometric properties of both the original English version of the CSS-10 and its translations into other languages, including Turkish (Selvi et al., 2019), German (Barke et al., 2016), Italian (Marino et al., 2020), Indian (Dagar et al., 2019), and Spanish (Arnáez et al., 2022).

The psychometric properties of Cyberchondria scales have been explored in various societies, revealing valuable insights. However, there is currently a lack of such scales tailored for Internet users in Saudi society. Hence, this study aims to fill this gap by adapting the Cyberchondria scale to the Saudi environment. This is particularly important given the findings of numerous studies indicating that anxiety sensitivity, health anxiety, and problematic internet use are significant risk factors for cyberchondria (Fergus & Dolan, 2014; Fergus & Spada, 2017).

It has also been shown that cyberchondria potentially overlaps with obsessive-compulsive symptoms (Fergus & Russell, 2016). Based on the preceding discussion, there is a clear need to translate and adapt this measure for the Saudi environment. This is of significant professional importance, particularly within the fields of guidance and counseling in Saudi society.

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

2. Study Questions

The current study seeks to answer the following questions:

1-What are the indicators of reliability of Cyberchondria scale**(CSS-12):** in the Saudi environment?

2-What are the indicators of validity of Cyberchondria scale**(CSS-12):** in the Saudi Environment?

3 .The Research Methodology :

1.Study Design To establish the psychometric properties of the Cyberchondria Severity Scale (CSS-12), the following phases of the study were conducted: translation into Arabic and linguistic validation, content validation, construct validation, concurrent validation, internal consistency assessment, and test-retest reliability analysis.

2.Participants and Procedure:

A community sample of 200 Arabic-speaking adults (55% women; mean age = 26.3535 ± 8.17240 years) participated in the study. Each participant provided informed written consent after receiving a description of the aims and procedures of the present study. Volunteers did not receive compensation for their participation

Table 1. Characteristic of participants (N = 200)

Gender,	% (n)
Male	90(45%)
Female	110(55%)
Age, M ± SD	26.3535 ± 8.17240
Range of age	18-35
Level of education, % (n)	
Master's degree	27(13.6%)
Higher	132(66.7%)
Secondary education	38(19.2%)

3.Instruments.

The Cyberchondria Severity Scale (CSS-12) is a 12-item self-report measure designed to assess cyberchondria. Responses are recorded on a 5-point scale, ranging from 1 ('never') to 5 ('always'), with total scores ranging between 12 and 60. The CSS-12 has demonstrated appropriate reliability, with Cronbach's α for its subscales ranging between .73 and .90, as well as convergent and divergent validity (McElroy et al., 2019).

Table 2. dimensions of the Cyberchondria Severity Scale Short-Form (CSS-12)

. Dimensions	Description	Items
Excessiveness	Escalating/repeated nature of searches	1, 3, 6
Distress	Anxiety/Distress as a result of searches	4, 8, 9
Reassurance	Searches driving individuals to seek out professional medical advice	5, 11, 12
Compulsion	Web searches interfering with other aspects of on/offline life	2, 7, 10

-Arabic adaptation

This process followed the guidelines for cross-cultural adaptation of self-report measures and involved the following steps

- Phase I: Two translations were carried out independently by two psychologists.
- Phase II: The two translations were then compared to each other, and a final combined version was made.
- Phase III: Back translation. The combined Saudi version, which was given to a mother-tongue English translator without reference to the original text, was translated back into English.

- Phase IV: A group of psychologists looked at the work, with particular attention paid to semantic equivalence, comprehension of terms, meaning, concepts, and psychological aspects in the questionnaire.

- Phase V: The final version, the Saudi translation, was reviewed. The English back translation and any comments from the focus groups were sent to the author (CSS-12) for approval (received).

- Finally, the translated versions were combined after achieving consensus on the items.

Analyses:

SPSS (Version 20) was used for all analyses. To address the first objective, item-level analyses were conducted to estimate means, standard deviations, normal distributions (skewness and kurtosis), and item messiness, as presented in Table 3. Additionally, reliability estimates (Cronbach's alpha and test-retest reliability) and validity estimates (content validity) were calculated.

Table 3. Item Analysis of of the Cyberchondria Severity Scale (CSS-12)

Items	M	SD	S	k	Corrected total-item correlations
1) If I notice an unexplained bodily sensation I will search for it on the internet	4.0101	1.00248	-.631-	-.254-	
2) Researching symptoms or perceived medical conditions online distracts me from reading news/sports/entertainment articles online	2.6919	1.31026	.450	-.877-	.471**
3) . I read different web pages about the same perceived condition	3.8434	1.13134	-.686-	-.394-	.675**
4) I start to panic when I read online that a symptom I have is found in a rare/serious condition	3.0152	1.24418	.243	-.847-	.576**
5) Researching symptoms or perceived medical conditions online leads me to consult with my GP	2.8081	1.17224	.227	-.628-	.720**
6) I enter the same symptoms into a web search on more than one occasion	3.5354	1.22423	-.343-	-.878-	.615**
7) Researching symptoms or perceived medical conditions online interrupts my work (e.g. writing emails, working on word documents or spreadsheets)	2.1212	1.21139	1.080	.251	.670**
8) I think I am fine until I read about a serious condition online	2.4848	1.29320	.660	-.650-	.750**
9) I feel more anxious or distressed after researching symptoms or perceived medical conditions online	2.9747	1.24402	.096	-.880-	.682**
10) Researching symptoms or perceived medical conditions online interrupts my offline social activities (e.g. reduces time spent with friends/family)	1.9798	1.11728	1.209	.728	.718**
11) I suggest to my GP/medical professional that I may need a diagnostic procedure that I read about online (e.g. a biopsy/ a specific blood test)	2.4848	1.28137	.495	-.784-	.666**
12) Researching symptoms or perceived medical conditions online leads me to consult with other medical specialists (e.g. consultants)	2.3838	1.20664	.626	-.457-	.716**

From Table 3, it was observed that one item, item (2), did not significantly correlate with the total score of the sub-scale. Therefore, it was decided to delete this item, resulting in the retention of 12 items for the current study.

Procedures

At time 1, participants completed online versions of the Cyberchondria Severity Scale (CSS-12) together with demographic details.

Ethical considerations

All procedures performed in this study involving human participants were in accordance with the Declaration of Helsinki (as revised in 2013). All participants provided informed consent and voluntarily filled out the questionnaires. Participant details were rigorously kept confidential throughout the entire research process.

4. Results:

Validity of the Cyberchondria Severity Scale (CSS-12).

Content Validity :

For the content validity of the CSS-12, it was presented to a group of arbitrators consisting of 6 faculty members from the Department of Psychology at Al-Imam Muhammad bin Saud Islamic University. The aim was to assess each item using a 2-point Likert response scale ('not relevant' or 'relevant') to determine whether the item was relevant for measuring cyberchondria. The content validity index (CVI) for each item and the total items were calculated from the proportion of judges who scored items as either 1 or 2. CSS-12 scores higher than 0.80 were accepted as the criterion.

Exploratory factor analysis:

The CSS-12-Saudi had a Kaiser-Meyer-Olkin (KMO) index of 0.869, which exceeded the recommended value of 0.6. Moreover, Bartlett's test for sphericity revealed significant results ($\chi2=1093.702$; $P<0.001$). These values indicated appropriate exploratory factor analysis results for this sample of 200 participants. Principal component analysis revealed that the two factors accounted for 58.14% of the variance. Each item demonstrated acceptable factor loading on each of the two factors. The communalities of all items ranged from 0.373 to 0.778.

The factorial analysis of the items revealed the presence of two factors, with eigenvalues exceeding the threshold, and item loadings on each factor exceeding 3.0, the minimum threshold for factor saturation. All items of the scale were saturated. The following table presents the extracted factors and their loadings after orthogonal rotation of the Cyberchondria Severity Scale (CSS-12)

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Table 4Exploratory factor analysis of Saudi version of the short form of the Cyberchondria Severity Scale (CSS-12): (n=200)

Items	First-Factor	Second-Factor	Communalities
13) If I notice an unexplained bodily sensation I will search for it on the internet	14)	15) .802	16) .685
17) Researching symptoms or perceived medical conditions online distracts me from reading news/sports/entertainment articles online	18) 313	19) .825	20) .778
21) I read different web pages about the same perceived condition	22) 490	23) .620	24) .624
25) I start to panic when I read online that a symptom I have is found in a rare/serious condition	26) 582	27) .371	28) .477
29) Researching symptoms or perceived medical conditions online leads me to consult with my GP	30) 791	31)	32) .627
33) I enter the same symptoms into a web search on more than one occasion	34) 803	35) -	36) .651
37) Researching symptoms or perceived medical conditions online interrupts my work (e.g. writing emails, working on word documents or spreadsheets)	38) 575	39)	40) .373
41) I think I am fine until I read about a serious condition online	42) 650	43)	44) .444
45) I feel more anxious or distressed after researching symptoms or perceived medical conditions online	46) 754	47)	48) .569
49) Researching symptoms or perceived medical conditions online interrupts my offline social activities (e.g. reduces time spent with friends/family)	50) 747	51)	52) .561
53) I suggest to my GP/medical professional that I may need a diagnostic procedure that I read about online (e.g. a biopsy/ a specific blood test)	54) 776	55) -	56) .627
57) Researching symptoms or perceived medical conditions online leads me to consult with other medical specialists (e.g. consultants)	58) 748	59)	60) .562
61) Eigenvalue	62) .381	63) 1 .597	64)
65) % of Variance	66) 4.841	67) 1 3.305	

The results were as follows:

The first factor, with a latent root of 5.381, explained approximately 44.841% of the total variance of the matrix. It is positively saturated with ten items from the Cyberchondria Severity Scale (CSS-12), specifically items 1 through 12. These items predominantly express the concept of excessiveness, suggesting that this factor can be named the 'Excessiveness' factor.The second factor, with a latent root of 1.597, explained about 13.305% of the total variance of the matrix. It is positively saturated with ten items from the Cyberchondria Severity Scale (CSS-12), namely items 1 through 4. These items primarily reflect the concept of reassurance, indicating that this factor can be named the 'Reassurance' factor .

Reliability of The CSS-12- Saudi

The reliability of the CSS-12 was assessed using Cronbach's alpha and item-total correlations. Test-retest reliability was established over a period of 3 weeks with 30 participants. In addition to calculating the test-retest reliability coefficient, paired tests were conducted to assess whether there were statistically significant score changes between the first and second CSS scores.

Table 5 Internal consistency and test-retest reliability for the (CSS-12)

Table 5 showed good reliability: the test-retest reliabilities and the findings of the internal consistency test for the CSS-12 demonstrated a high level of alpha for the overall scale, indicating good reliability of the translated scale.

Subscales	Number of items	Internal consistency Cronbach's alpha N = 200	Test-retest ICC*** (95% CI) N = 30
total Scale .,	30	0.89	0.80

5. Discussion and Implications:

This study examined the psychometric properties, including convergent validity, factorial validity, and internal consistency, of the Saudi version of the short form of the Cyberchondria Severity Scale (CSS-12).

There are four unique attributes of this study. Firstly, it is conducted within a non-Western context, with a specific focus on the Saudi population. While researchers have increasingly investigated Cyberchondria Severity on a global scale, they have often relied on translated measures originally developed in Western societies.

The results of the current study regarding the psychometric indicators of the scale are consistent with findings from previous studies. This agreement strongly suggests that the Cyberchondria Severity Scale (CSS-12) demonstrates validity and stability across different cultures. Such consistency encourages further research in both the broader Arab environment and specifically in Saudi Arabia. While there remains a need for additional examination of this model in Arab and Saudi contexts, the translated version of the Cyberchondria Severity Scale (CSS-12) has exhibited generally good psychometric properties when applied to a sample of Saudi society.

Of note, the Cyberchondria Severity Scale (CSS-12) offers an opportunity to assess the excessive use of health websites, which can fuel health anxiety in individuals with cyberchondria. Patients with generalized hypochondria often believe they suffer from disorders with common or vague symptoms. The results of the current study, along with its theoretical framework, confirm the potential for the Cyberchondria Severity Scale (CSS-12) to be generalized across cultures on a large scale. This model could become a universal tool across different cultural backgrounds. Therefore, it is highly desirable to conduct empirical studies in various cultures.

Translation of a preexisting questionnaire into a different language and its subsequent validation are important steps to understand the psychometric properties of a given scale and enable cross-cultural comparisons. The CSS-12 has been previously translated and validated into multiple languages, including Spanish (Arnáez et al., 2022), Italian (Marino et al., 2020), German (Barke et al., 2016), and Turkish (Selvi et al., 2019). The introduction of an Arabic version of the CSS-12 will allow clinicians and researchers to examine the similarities and differences in Cyberchondria Severity among young people from different countries.

6. Conclusions :

In conclusion of this general discussion, it will be interesting to investigate the possibility of detecting cross-cultural variation in Cyberchondria Severity. Although this model was based on personality lexicons in many European and Asian languages, there could still be variations in the behavioral manifestations of these dimensions due to cultural and ethnic diversity. Such variations could have implications for our understanding of the disorder in different cultures.

This study details the development and validation of a short-form version of the Cyberchondria Severity Scale (CSS-12). The latent structure of the CSS-12 corresponds to four previously identified factors: 'Excessiveness', 'Distress', 'Compulsion', and 'Reassurance'. Confirmatory bifactor modeling indicated that the CSS-12 is best scored as a one-dimensional scale, although the sub-scales may provide useful additional information.

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REFERENCES

Arnáez, S., García-Soriano, G., Castro, J., Berle, D., & Starcevic, V. (2022). The Spanish version of the short form of the Cyberchondria Severity Scale (CSS-12): Testing the factor structure and measurement invariance across genders. *Current Psychology*, 1-10.

Bajcar, B., Babiak, J., & Olchowska-Kotala, A. (2019). Cyberchondria and its measurement. The Polish adaptation and psychometric properties of the Cyberchondria Severity Scale CSS-PL. *Psychiatria Polska, 53*(1), 49-60.

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, 595-605.

Baumgartner, S. E., & Hartmann, T. (2011). The role of health anxiety in online health information search. *Cyberpsychology, behavior, and social networking, 14(10),* 613-618.

Doherty-Torstrick, E. R., Walton, K. E., & Fallon, B. A. (2016). Cyberchondria: parsing health anxiety from online behavior. *Psychosomatics,* 57(4), 390-400.

Dagar, D., Kakodkar, P., & Shetiya, S. H. (2019). Evaluating the cyberchondria construct among computer engineering students in Pune (India) using Cyberchondria Severity Scale (CSS-15). *Indian Journal of Occupational and Environmental Medicine*, 23(3), 117.

Fergus, T. A. (2013). Cyberchondria and intolerance of uncertainty: examining when individuals experience health anxiety in response to Internet searches for medical information. Cyberpsychology, *Behavior, and Social Networking*, 16(10), 735-739.

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,* 24(6), 1322-1330.

Jokić-Begić, N., Mikac, U., Čuržik, D., & Sangster Jokić, C. (2019). The development and validation of the short cyberchondria scale (SCS). *Journal of Psychopathology and Behavioral Assessment*, 41, 662-676.

Marino, C., Fergus, T. A., Vieno, A., Bottesi, G., Ghisi, M., & Spada, M. M. (2020). Testing the Italian version of the Cyberchondria Severity Scale and a metacognitive model of cyberchondria. *Clinical Psychology & Psychotherapy*, 27(4), 581-596.

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

Mubeen Akhtar TF.(2019). Exploring cyberchondria and worry about health among individuals with no diagnosed medical condition. *JPMA.;70(1):90*.

Selvi, Y., Turan, S. G., Sayin, A. A., Boysan, M., & Kandeger, A. (2019). The Cyberchondria Severity Scale (CSS): Validity and reliability study of the Turkish version. *Sleep and Hypnosis (Online), 20(4), 241-246.*

Silva, F. G. D., Andrade, R., Silva, I., & Cardoso, A. (2016). Cross-cultural adaptation of the Cyberchondria severity scale for Brazilian Portuguese. *Trends in Psychiatry and Psychotherapy, 38, 90-95*.

Uzun, S. U., & Zencir, M. (2021). Reliability and validity study of the Turkish version of cyberchondria severity scale. *Current Psychology*, 40, 65-71.

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 .