The assessment of cyberchondria: Instruments for assessing problematic online health-related research

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Abstract

Purpose of review: Cyberchondria is a problematic, i.e., distressing or anxiety-increasing pattern of online health information seeking. The development of psychometrically sound instruments for the assessment of cyberchondria is imperative for better understanding of this construct. The aim of the present article is to provide a systematic literature review of cyberchondria instruments.

Recent findings: Although several measures of cyberchondria have been developed, the Cyberchondria Severity Scale (CSS) has been used most often. The CSS is based on a solid theoretical framework, with very good to excellent reliability and validity. It has been translated into several languages. Modifications of the original version of the CSS have been introduced to refine its conceptual foundation and improve its utility by making it shorter.

Summary: Further improvement of the CSS may boost the quality of cyberchondria research. There remains a need to test the theoretical underpinnings of the CSS and consider alternative models of cyberchondria.

Keywords:

Introduction

The Internet and digital technology have revolutionised searches for health-related information. Instead of relying on medical books and encyclopaedias and consulting medical professionals, most people now turn to the Internet for any enquiry about health- or illness-related matters. Although several factors seem to have contributed to this change, it is likely due to the ease with which health information can be accessed via the Internet.

Online health research (OHR) allows millions of people worldwide to quickly obtain information that they need, with a generally empowering effect. Some individuals, however, report a higher level of anxiety or distress during or after OHR. This outcome, coupled with a pattern of excessive or repetitive OHR, came to be known as cyberchondria [1, 2].

Cyberchondria quickly became an object of interest to clinicians and researchers, but studies were hampered by a lack of instruments assessing the construct. That changed in 2014, when the first cyberchondria scale appeared [3]. Years that followed have seen flourishing of cyberchondria research, along with efforts to improve the original instrument and introduce others.

The present article focuses on the assessment of cyberchondria and aims to present and critically review the psychometric properties of instruments developed thus far to assess cyberchondria. The article will also highlight the shortcomings of the present instruments, identify the gaps in the relevant literature and offer suggestions for further research.

Methods

We conducted a systematic review in accordance with the recommended PRISMA guidelines [4]. We searched PubMed, Web of Science, ScienceDirect, Scopus, PsycINFO and Google

Scholar for the relevant publications published until February 2020. Search terms included combinations of the following text words: cyberchondria AND scale OR measure OR instrument OR test OR questionnaire OR inventory OR self-report OR development OR validation OR reliability OR validity OR psychometric. Publications were identified on the basis of two or more of these terms, whereby one of them had to be cyberchondria. We did not search for unpublished studies.

The following criteria were used to identify publications for possible inclusion in this systematic review: 1) Full-length, peer-reviewed journal articles or book chapters published in English; 2) Publications reporting original data; 3) Use of an instrument to assess cyberchondria; 4) Reporting of at least one psychometric property (e.g., internal consistency) of the instrument used to assess cyberchondria. Abstracts and review articles were excluded.

The following data were extracted from the selected publications: authors and year of publication, instrument(s) used in the publication, country, sample size, basic demographic characteristics of the sample, type of sample, method of recruitment, health status of study participants and main psychometric properties of the instruments. The latter included the factor structure; intercorrelations between subscales; correlations between subscales and total scale scores; internal consistency; and correlations between total scale scores and subscales on one hand and other scales of relevance on the other. Additional information was extracted for the specific scales and/or for specific purposes, e.g., whether there were any data on cut-off points.

Results

Figure 1 shows that of the 33 articles identified through the searches, 24 met our inclusion criteria and were included in the systematic review. Figure 1 also shows reasons for excluding articles.

[FIGURE 1 ABOUT HERE]

Characteristics of the articles and samples

Table 1 presents the main characteristics of the articles and samples included in the present systematic review. All identified instruments are based on self-report. Of the 24 articles, 21 reported on the Cyberchondria Severity Scale (CSS) and 4 reported on four other cyberchondria instruments. Of the 21 articles addressing the CSS, 13 reported on the full, 33-item version, 10 reported on the 30-item version (CSS-30) and 1 article each reported on the 15-item version (CSS-15), 15-item version modified to a 12-item version (CSS-15-Revised) and 12-item version (CSS-12). Several articles reported findings based on more than one sample [5-9], whereas 2 articles were based on the same sample [10, 11], resulting in 29 samples across 24 articles.

Almost one half of articles were based on samples from the USA (10 articles) and Puerto Rico/USA (1). The remaining articles used samples from Turkey (4), Poland (2), UK (2), Croatia (1), Germany (1), Iran (1) and Australia (1). One study published by the Australian and Swiss authors restricted participation to English-speaking individuals from Australia, Canada, Ireland, New Zealand, the UK and USA [12]. Sample sizes across the articles varied from 86 to 1200 (mean = 413). The majority of participants were women in 21 of the 28 samples for which the data on gender were available, and the proportion of women across all 28 studies ranged from 35.5% to 87.2%. The mean age of participants ranged from 19 to 39 years across 26 samples, with the mean age in 16 samples being between 31 and 39 years.

The majority of studies were conducted in community samples (6 samples) and online community samples (7 samples), with some studies including only community subjects using the Internet for health searches (3 samples) or online community subjects using the Internet for health searches (5 samples). The remaining samples consisted of university students, including undergraduate students (6 samples), university employees (1 sample) and treatment-seeking individuals with the DSM-5 illness anxiety disorder or DSM-5 somatic symptom disorder (1 sample). The method of recruitment was described for 15 of the 29 samples and involved use of an online crowdsourcing platform to recruit 10 samples. Health status was taken into consideration or noted when recruiting 12 of the 29 samples, with 3 studies excluding subjects with medical conditions and 3 studies excluding subjects with current or recently diagnosed severe mental disorders.

[TABLE 1 ABOUT HERE]

Cyberchondria Severity Scale

The CSS [3], developed in the UK, has been the most widely used instrument in cyberchondria research. It has been translated into several languages, but the psychometric properties have been published only for the German [5], Polish [13*] and two Turkish [14, 15] versions of the CSS. The Croatian version only reported data on internal consistency [9] and the Iranian version only reported total CSS score correlations with other scales [16].

The basis for the development of the CSS was the definition of cyberchondria as an "increase in anxiety about one's own health status, as a result of excessive reviews of online health information" [3, p. 259] and the conceptualisation of cyberchondria as a "multi-dimensional construct, reflecting both anxiety and an element of compulsiveness" [3, p. 260]. The stated aim of the CSS is to measure anxiety as a result of online searches for health information. It was not developed as a screening tool for cyberchondria and corresponding

cut-off scores were not established. The CSS initially consisted of 43 items that were generated by means of a review of the cyberchondria literature and conceptually related to anxiety disorders.

The original CSS ("full CSS") consists of 33 items that are scored on a 5-point scale [3]. Scores on each item are summed up to provide a total CSS score. Exploratory factor analysis of the CSS revealed 5 factors: Compulsion, Distress, Excessiveness, Reassurance (or Reassurance Seeking) and Mistrust of Medical Professionals (MMP). These factors represent separate subscales and scores on each subscale can be calculated separately. Compulsion was conceptualised to reflect "an unwanted, compulsive element" of cyberchondria and refers to ways in which OHR interrupts activities. Distress denotes negative emotional states (e.g., anxiety) associated with OHR. Excessiveness involves repetitious and time-consuming OHR, often relying on numerous online sources. Reassurance reflects a need to seek reassurance about health-related matters from a suitably qualified person such as medical professionals. Finally, MMP was originally conceptualised as a "conflict" as to whether one should trust medical professionals or the results of one's own OHR, with greater confidence in the latter.

[TABLE 2 ABOUT HERE]

Table 2 shows psychometric properties of the CSS across 13 studies. The original study by McElroy and Shevlin [3] used exploratory factor analysis to identify the 5-factor structure of the CSS. Additional six studies identified the same 5-factor structure, one of them using exploratory factor analysis, one using principal component analysis and four using confirmatory factor analysis. Using confirmatory factor analysis, one study reported bifactor modelling with a General Cyberchondria Factor and Specific Factors that comprise Compulsion, Distress, Excessiveness, Reassurance and MMP [10]. Except for the MMP subscale, the intercorrelations between the CSS subscales ranged between 0.26 and 0.80,

while their correlations with the total CSS score ranged from 0.65 to 0.89. These correlations support conceptual coherence of the CSS.

Internal consistency for the total CSS was excellent, with Cronbach α ranging between 0.91 and 0.96 in 10 studies and only one study reporting Cronbach α of 0.89. Likewise, internal consistency was excellent for the Compulsion subscale (Cronbach α ranging between 0.90 and 0.96 in 6 studies, with one study reporting Cronbach α of 0.88) and Distress subscale (Cronbach α ranging between 0.92 and 0.95 in 6 studies, with one study reporting Cronbach α of 0.87). Internal consistency figures for the Excessiveness and Reassurance subscales were generally good: for the Excessiveness subscale, Cronbach α ranged between 0.85 and 0.91 in 5 studies, with one study reporting Cronbach α of 0.74, whereas for the Reassurance subscale, Cronbach α ranged between 0.80 and 0.89 in 5 studies, with one study reporting Cronbach α of 0.76.

Test-retest reliability of the CSS was assessed in 2 studies using translated versions. For one of the Turkish translations, a reliability figure in 66 participants over a 2-week period was 0.65 for the total CSS, while the corresponding figures for the CSS subscales ranged from 0.53 to 0.71 [14]. The reported test-retest reliability figures for the CSS subscales of the Polish version over a period of 3 months in 59 participants ranged from 0.58 to 0.76 [13*].

Convergent validity of an instrument can be assessed by examining the strength of correlations between measures of the two conceptually related constructs. Close relationships have been postulated theoretically or based on research not relying on the CSS between cyberchondria and health anxiety [1], problematic Internet use [17] and obsessive-compulsive disorder (OCD) [18]. Therefore, convergent validity of the CSS could be examined via its correlations with measures of health anxiety, problematic Internet use and OCD. Table 2 shows that convergent validity of the CSS is solid because the correlations between the total CSS and measures of health anxiety such as the Short Health Anxiety Inventory and

Modified Version of the Short Health Anxiety Inventory ranged between 0.53 and 0.59. In one study, however, the correlation between the total CSS and the Health Anxiety Inventory was only 0.23 [15]. With regards to problematic Internet use, only one study reported a correlation of 0.45 between the total CSS and the Internet Addiction Test [15], suggesting good convergent validity of the CSS. Although somewhat lower, the correlations between the total CSS and measures of OCD such as the total Dimensional Obsessive-Compulsive Scale (rs = 0.38 and 0.49) and the subscales of Maudsley Obsessive-Compulsive Inventory (rs = 0.27-0.40) also support a solid convergent validity of the CSS.

Divergent validity of an instrument is assessed by examining the strength of correlations between measures of the constructs that are conceptually unrelated or less related. Cyberchondria is expected to be less related to depression and correlations between the measures of these two constructs are therefore expected to be relatively low. Indeed, the correlations between the total CSS and measures of depression, such as the Depression subscale of the Depression, Anxiety and Stress Scale – 21-Item Version (rs = 0.22 and 0.24) and the Center for Epidemiologic Studies Depression Scale (r = 0.31) were generally weaker. This provides some support to the divergent validity of the CSS.

[TABLE 3 ABOUT HERE]

The MMP subscale of the CSS consists of 3 items, which are the only reverse-scored items of the CSS. The performance of the MMP subscale was different from other CSS subscales, as shown in Table 3. Its correlations with other CSS subscales were lower or negative (ranging from -0.16 to 0.44), as were the correlations with the total CSS (ranging between 0.12 and 0.41). Internal consistency of the MMP subscale was considerably lower compared to the other CSS subscales, with Cronbach α ranging between 0.62 and 0.89 across 9 studies and being lower than 0.69 in 4 studies. Correlations between the MMP subscale and measures of health anxiety, problematic Internet use, OCD, other anxiety-related variables

and depression were generally weak, often nonsignificant and at times negative. These findings suggest that the MMP subscale may not assess the same overarching construct of cyberchondria as the other CSS subscales and that it may not belong to the CSS. It has been suggested that the MMP score might still have some value, but that it should be calculated separately from the CSS score [13*, 19]. Consequently, several authors proposed a removal of the MMP subscale items from the CSS [5, 10, 14]. This led to the development of shorter and modified versions of the CSS.

30-item version of the Cyberchondria Severity Scale

Given the problems with the MMP subscale, several authors have used the CSS without 3 items of the MMP subscale. The psychometric properties of this 30-item version of the CSS (CSS-30) are reported in Table 4.

In two studies [13*, 20], a confirmatory factor analysis identified 4 factors/subscales of the CSS-30: Compulsion, Distress, Excessiveness and Reassurance. In terms of the correlations between these 4 CSS-30 subscales (ranging between 0.42 and 0.78) and the correlations between the 4 CSS-30 subscales and the total CSS-30 score (ranging from 0.73 to 0.90), the CSS-30 performs similarly to the full CSS (if the MMP subscale is not taken into account).

Internal consistency for the total CSS-30 was excellent (Cronbach $\alpha = 0.95$ and 0.96 across 7 studies) and therefore somewhat better than internal consistency for the total full CSS. Similarly, internal constancy values for the Compulsion (Cronbach $\alpha = 0.95$ and 0.96 across 2 studies), Distress (Cronbach $\alpha = 0.95$ across 2 studies), Excessiveness (Cronbach $\alpha = 0.87$ across 2 studies) and Reassurance (Cronbach $\alpha = 0.85$ and 0.88 across 2 studies) subscales of the CSS-30 were excellent to good and somewhat better than internal

consistency values for the same subscales of the full CSS. There are no published data on test-retest reliability of the CSS-30.

Convergent validity indices for the CSS-30 were similar to those for the full CSS, with strongest correlations reported with measures of health anxiety or measures related to health anxiety, such as the Short Health Anxiety Inventory (rs = 0.52-0.58), Whiteley Index/Whiteley Index-6 (rs = 0.56-0.67) and Metacognitions Questionnaire – Health Anxiety (rs = 0.32-0.66). The correlation with a measure of problematic Internet use (Problematic Internet Use Questionnaire) was also robust (r = 0.59), whereas the correlations with a measure of OCD (total Dimensional Obsessive-Compulsive Scale) were somewhat lower (rs = 0.38-0.49). Divergent validity of the CSS-30 has not been examined, as no study reported the correlations with measures of depression or other conceptually unrelated constructs.

[TABLE 4 ABOUT HERE]

15-item and 12-item versions of the Cyberchondria Severity Scale

A general tendency to shorten self-report instruments has played a role in several attempts to decrease the number of items of the CSS. The first such attempt was made by Barke et al. [5] in their German version of the scale. They conducted a principal components analysis of the full CSS and retained the 3 best-performing items from each of the 5 CSS subscales based on their factor loadings, thereby forming a 15-item version (CSS-15). A confirmatory factor analysis identified 5 factors/subscales, but their intercorrelations and the correlations with the total CSS-15 score were much lower than those reported for the full CSS and CSS-30 (Table 4). Internal consistency values for the total CSS-15 (Cronbach α = 0.82) and for the CSS-15 subscales (Cronbach α = 0.67-0.86) were also lower. Indices of convergent and divergent validity of the CSS-15 were good (Table 4).

Another shorter version of the CSS was based on the CSS-15, except for 3 items of the MMP subscale. This resulted in a 12-item instrument, referred to as CSS-15-Revised [7]. Internal consistency for the total CSS-15-Revised (Cronbach $\alpha = 0.88$) was better than that for the CSS-15, with solid convergent validity (Table 4). Divergent validity was not assessed.

The authors of the original CSS developed an abbreviated version of the CSS containing 12 items (CSS-12) [21**]. They first conducted an exploratory factor analysis of the full CSS and selected for inclusion in the CSS-12 3 items from each factor/subscale except for the MMP subscale. This selection was made on the basis of several criteria: factor loadings, endorsement rates, impact on subscale internal consistency, length and content. The CSS-12 thus consists of 4 factors/subscales. Internal consistency for the total CSS-12 was excellent (Cronbach $\alpha = 0.90$), but lower than internal consistency for the full CSS and CSS-30 (Table 4). Likewise, internal consistency figures for the CSS-12 subscales were lower (Cronbach $\alpha = 0.73$-0.87). Total score of the CSS-12 correlated more strongly with a measure of health anxiety ($r = 0.53$) than with a measure of general anxiety ($r = 0.30$), suggesting a good convergent validity. Divergent validity was not assessed.

Other translations of the Cyberchondria Severity Scale

The CSS has been translated into several other languages and used in several non-English speaking samples. However, data on psychometric properties of these translated versions of the CSS are not available in peer-reviewed journals published in English. Therefore, the corresponding articles have not been included in the present systematic review. Still, it should be noted that the CSS has been translated into Brazilian Portuguese [22] and that Indonesian version of the CSS was used in one study [23]. The CSS was also used in published studies conducted in Pakistan [24, 25], India [26, 27] and Sri Lanka [28]. The original English

version of the CSS was administered in some of these studies [25, 27], while other studies did not provide details of translations into local languages [24, 26, 28].

Other cyberchondria instruments

Four additional cyberchondria instruments have been developed in recent times: Cyberchondria Scale (CS) [8], Short Cyberchondria Scale (SCS) [9], Brief Cyberchondria Scale (BCS) [29] and Cyberchondria Tendency Scale (CTS) [30]. This is partly a consequence of a need for measures that would be more "culturally specific", that is, suitable for various non-English speaking populations. Hence, two of these scales were developed in Turkey (CS and CTS), one was developed in Croatia (SCS) and another in Puerto Rico for Hispanics/Spanish-speaking people (BCS). Two measures reflect a tendency to further shorten cyberchondria instruments, with SCS consisting only of 4 items and BCS having 10 items. Another reason for introducing new cyberchondria measures can be found in different theoretical frameworks for cyberchondria and different purposes of these instruments.

Although the CS and CSS are both based on the notion that cyberchondria is a multidimensional construct, these dimensions overlap, but are not the same. Consequently, the aim of the CS is to measure the level of cyberchondria focusing on information-seeking behaviour (or OHR) and characteristics of online health-related material that both increase and *decrease* anxiety. In contrast, the SCS is based on the premise that the "core element" of cyberchondria is anxiety *amplification* following OHR. The BCS was developed on the assumption that cyberchondria represents OHR *driven by health anxiety*. The stated purpose of the CTS is to assess Internet users' "*tendency to cyberchondria*", i.e., the extent to which they use health information obtained online and seek a "solution" online when having health problems.

[TABLE 5 ABOUT HERE]

Table 5 presents the psychometric properties of the CS, SCS, BCS and CTS. Their factor structure differs from one scale to another, which is a consequence of their different conceptual underpinnings. Some of the factors/subscales resemble those of the CSS, while others are unrelated to them. Internal consistency for all the instruments was excellent (Cronbach α = 0.92, 0.93 and 0.94 for total BCS, CS and CTS, respectively), except for the SCS (Cronbach α = 0.73). Correlations with measures of health anxiety were generally robust, suggesting a relatively good convergent validity for the BCS, CS and SCS. Unlike any version of the CSS, the BCS and CTS provide instructions for scoring and for distinguishing between various degrees of severity of "cyberchondria symptoms" (BCS) and "cyberchondria tendencies" (CTS).

Discussion

The CSS has dominated cyberchondria research. This is mainly due to two reasons. First, the CSS is based on a credible theoretical conceptualisation of cyberchondria, according to which it is a multidimensional construct that comprises excessive OHR, corresponding distress or anxiety, interference with activities and reassurance seeking from offline sources, usually medical professionals. These 4 components of cyberchondria are assessed via the corresponding subscales of the CSS.

Second, the CSS has very good to excellent psychometric properties. Internal consistency for the total CSS is excellent, which is particularly important considering the postulated multidimensional nature of the cyberchondria construct. Moreover, internal consistency of the CSS subscales that assess distress and interference with activities is also excellent. Internal consistency for the subscales assessing the excessive nature of OHR and

reassurance seeking is acceptable to good and could be improved. This also suggests that excessive OHR and reassurance seeking from medical professionals as components of the cyberchondria construct may require further conceptual elaboration. The CSS has a solid convergent validity, as demonstrated by strong correlations with measures of health anxiety and to a lesser extent, measures of problematic Internet use. Correlations with measures of OCD have been generally weaker than those with health anxiety, suggesting that the CSS reflects the relationship between cyberchondria and health anxiety more than the one between cyberchondria and OCD. The CSS appears to have a solid divergent validity, but there is a need for further research examining the correlations between the CSS and measures of the constructs conceptually unrelated to cyberchondria such as depression, social anxiety or impulsivity.

The validity of the CSS is also supported by numerous studies that have confirmed the overall factor structure. This provides confidence in each of the five subscales as reflective of specific domains of cyberchondria, notwithstanding the less convincing findings for the MMP subscale. Further research should take into account bifactor modelling of the CSS reported by Norr et al. [10] and reconsider the notion that cyberchondria is a unitary construct, best described as including both a factor which incorporates all items, as well as the separate factors. Although the interpretation of CSS total scores as indicative of a unitary concept of cyberchondria is generally assumed to be correct, this has not always been supported. For example, Fergus [19] did not find that CSS subscales "tapped" a general cyberchondria factor, leaving open the possibility that CSS subscales reflect relatively independent, separate constructs.

The full version of the CSS may not be practical for routine use because of its length (33 items). Another shortcoming of the CSS is the lack of a clear scoring system. A performance of the MMP subscale that was incongruent with that of the other CSS subscales

has been addressed by omitting the 3 MMP subscale items from the scale (as in the CSS-30) or by calculating the score on this subscale separately from the total CSS score. The psychometric properties of the CSS-30 are comparable to those of the full CSS. The same generally holds true for even shorter versions of the CSS: CSS-15, CSS-15-Revised and CSS-12. Lower internal consistency values for the shorter versions of the CSS are possibly a consequence of fewer scale items. However, the approach taken to construct shorter forms of the CSS may not necessarily allow these instruments to "capture" the full extent of the construct as the original CSS [31]. Therefore, modifications of the CSS call for further examination of their reliability and validity.

The development of other cyberchondria instruments reflects a growing interest in cyberchondria. These measures are difficult to compare with the CSS because their theoretical foundations and purposes are different. Furthermore, they have been developed mainly for use in certain non-English speaking countries. Despite their generally solid psychometric properties, it does not seem very likely that these instruments will be used across different countries, perhaps except for the BCS, which may be used in various Spanish-speaking countries.

Future studies of the CSS and other cyberchondria instruments need to be conducted in treatment-seeking or clinical samples to ascertain their responsiveness to changes with treatment. Only one study so far [32**] has been conducted in a treatment-seeking sample. Further research should control for individuals who were medically or psychologically unwell at the time of assessment. While internal consistency, convergent and divergent validity of the CSS and its variants are well established, there is a need for further detailed psychometric examination. For instance, additional examination of test-retest reliability will determine whether these measures are consistent in capturing the concept of cyberchondria across time. Studies should ideally investigate the invariance of the factor structure across

different samples and population groups and the item response characteristics for each item of the scale. More work also remains to be done in terms of the interpretation of the CSS scores. It would be useful, for example, to have guidance on classifying cyberchondria cases into mild, moderate and severe based on their CSS scores. This is of particular importance for use of the CSS in clinical practice and for public health purposes. Another issue is the conceptual status of cyberchondria and the question of what the CSS is assessing: a distinct entity or several interrelated phenomena and behaviours.

The near-ubiquitous use of the CSS in cyberchondria research has been helpful for comparing findings across studies. However, this fact also carries the limitation that almost everything that we know about cyberchondria is based on use of the CSS in research. The model of cyberchondria upon which the CSS was constructed is not necessarily accurate, while CSS-based research findings implicitly (or even explicitly) endorse such a model. This situation calls for development of other approaches to cyberchondria, which would be compared with the CSS-based model. Such approaches might introduce different theoretical frameworks and associated assessment tools, including clinician-administered interviews. This endeavour would then allow a more adequate appraisal of the validity of the CSS.

Conclusion

To the best of our knowledge, this is the first published systematic review of cyberchondria instruments. To date, the cyberchondria literature has relied heavily on a single measure – the CSS. It is critically important that the CSS and its derivatives have robust psychometric properties as our understanding of the construct of cyberchondria and its place in the landscape of conceptually similar constructs hinges upon valid and reliable measurement.

This is particularly the case for understanding the relationships between cyberchondria, health anxiety, problematic Internet use and OCD. While the CSS has met the standard thresholds for psychometric validation, there remains considerable scope for refinement.

Compliance with Ethics Guidelines

Conflict of Interest

The authors declare no conflicts of interest in the production of this work.

Human and Animal Rights and Informed Consent

This article does not contain any studies with human or animal subjects performed by any of the authors.

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Figure 1. PRISMA flowchart: Selection of the original studies reporting on the psychometric properties of measurement instruments for cyberchondria.

Identification

Records identified through database searching
(Web of Science, PubMed, ScienceDirect,
PsychINFO, Scopus, Google Scholar)
N = 33

Screening

Records excluded
N = 8
Reasons for exclusion:
- Review articles (n = 2)
- Not using a cyberchondria instrument (n = 6)

Full-text articles assessed for eligibility
N = 25

Eligibility

Full-text article excluded
N = 1
Reason for exclusion:
- Not reporting on any psychometric property of the cyberchondria instrument used in the study

Inclusion

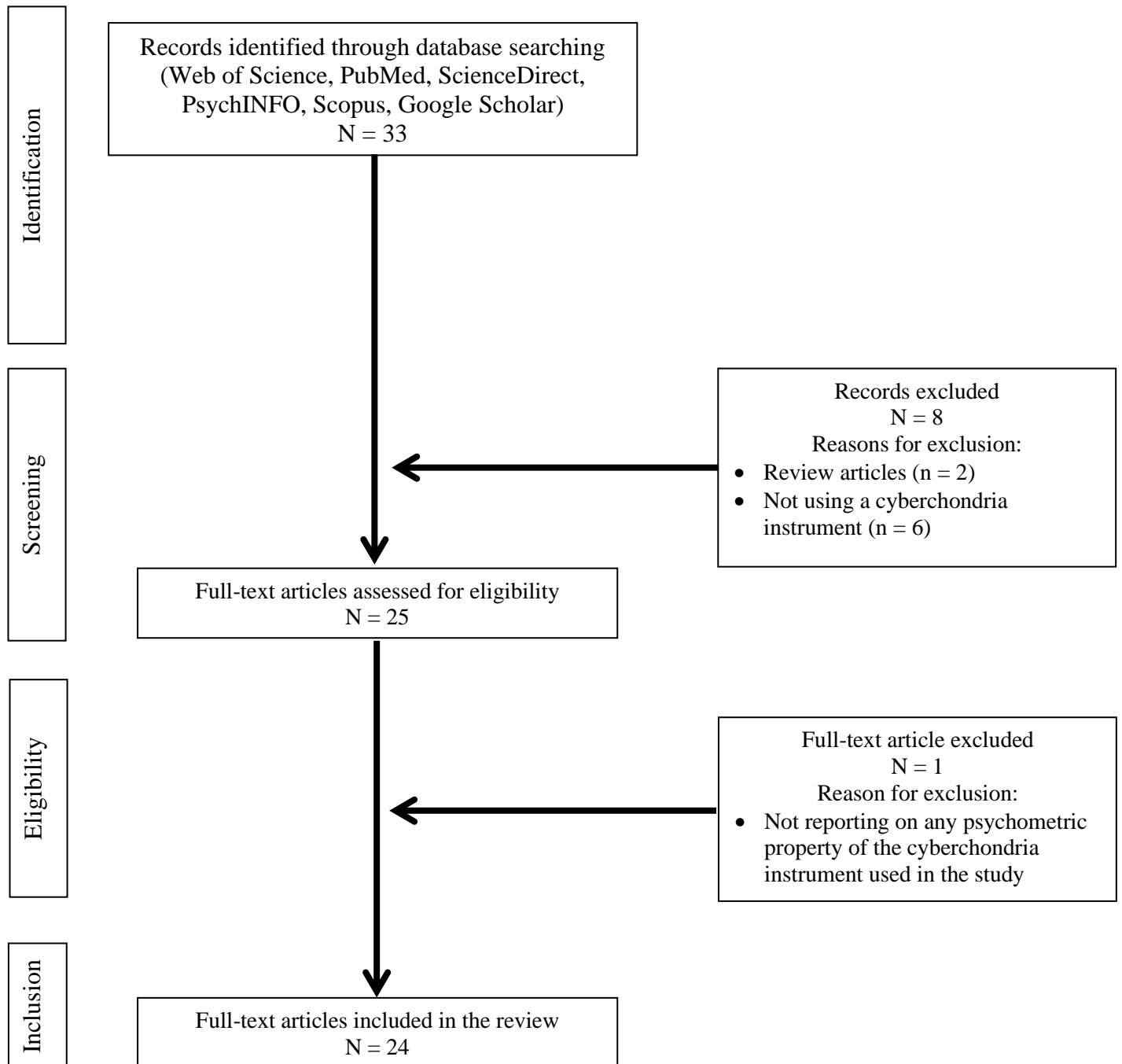Full-text articles included in the review
N = 24

Table 1. Characteristics of the articles (N=24) and samples (N=29) in which the Cyberchondria Severity Scale (CSS), modified versions of the CSS and other cyberchondria scales were tested or in which the psychometric properties of these instruments were described.

Article and sample	Instrument	Country	Sample size	% females	Mean age (years)	Age range (years)	Sample characteristics	Recruitment method	Health status taken into consideration or noted during recruitment
McElroy & Shevlin, 2014 [3]	CSS	UK	208	63.9	24.2±8.2	18-60	University undergraduate students	NR	No
Fergus, 2014 [19]	CSS, CSS-30	USA	539	43.4	31.3±9.9	18-67	Online sample using the Internet for health searches	Online crowdsourcing platform - MTurk	Yes (individuals with medical conditions were excluded)
Norr et al., 2015 [10] & Norr et al., 2015 [11]	CSS	USA	526	69.2	34.9±12.4	18-72	Online community sample	Online crowdsourcing platform - MTurk	No
McElroy et al., 2019 [21**]	CSS, CSS-12	UK	661	73.0	22.2±5.9	NR	University undergraduate students	NR	No
Starcevic et al., 2019 [12]	CSS	Australia & Switzerland†	751	NR	NR	NR	Online sample using the Internet for health searches during previous 3 months	Online crowdsourcing platform - PROL	No
Newby & McElroy, 2020 [32**]	CSS	Australia	86	87.2	30±12	18-65	Treatment-seeking individuals with illness anxiety disorder (DSM-5) or somatic symptom disorder (DSM-5)	NR	Yes (individuals with psychosis, bipolar affective disorder and severe depression were excluded)
Barke et al., 2016 [5] – Sample A	CSS	Germany	500	73.6	29.1±10.4	NR	Online community sample	NR	Yes (but individuals with current illness were not excluded)
Bajcar et al., 2019 [13*]	CSS, CSS-30	Poland	380	53.4	26.5±11.1	19-68	Community sample	NR	No
Uzun & Zencir, 2018 [14]	CSS	Turkey	335	35.5	38.2±8.5	19-61	University employees	NR	No
Selvi et al., 2018 [15]	CSS	Turkey	337	55.8	21.8±5.2	16-55	University students	NR	No
Zangoulechi et al., 2018 [16]	CSS	Iran	177	72.9	NR	NR	University students	NR	No
Fergus, 2015 [33]	CSS-30	USA	578	43.7	31.2±9.8	NR	Online community sample	Online crowdsourcing platform - MTurk	Yes (individuals with medical conditions were excluded)
Norr et al., 2015 [34]	CSS-30	USA	468	71.6	35.4±12.5	18-72	Online community sample	Online crowdsourcing platform - MTurk	No
Fergus & Spada, 2017 [6] – Sample 1	CSS-30	USA	337	50.1	33.3±11.5	18-65	Online sample using the Internet for health searches	Online crowdsourcing platform - MTurk	Yes (25.5% had medical conditions)

Fergus & Spada, 2017 [6] – Sample 2	CSS-30	USA	260	40.8	32.9±9.2	19-69	Online sample using the Internet for health searches	Online crowdsourcing platform - MTurk	Yes (29.2% had medical conditions)
Fergus & Spada, 2018 [7] – Sample 1	CSS-30	USA	330	66.6	19.4±2.1	18-47	University undergraduate students	NR	No
Fergus & Russell, 2016 [35]	CSS-30	USA	375	47.3	31.6±10.2	19-64	Online community sample	Online crowdsourcing platform - MTurk	Yes (individuals with medical conditions were excluded)
Mathes et al., 2018 [20]	CSS-30	USA	462	64.3	36.6±12.9	18-77	Online community sample	Online crowdsourcing platform - MTurk	No
Gibler et al., 2019 [36]	CSS-30	USA	221	70.6	19.2±1.7	19-33	Undergraduate students	NR	Yes (percentage with various types of pain and related problems was noted)
Bajcar & Babiak, 2019 [37]	CSS-30	Poland	207	58.9	31.5±13.0	19-64	Community sample	Snowball method	No
Barke et al., 2016 [5] – Sample B	CSS-15	Germany	292	76.4	24.2±4.1	NR	Online community sample	NR	Yes (but individuals with current illness were not excluded)
Fergus & Spada, 2018 [7] – Sample 2	CSS-15-Revised	USA	331	53.5	38.7±10.4	22-74	Online sample using the Internet for health searches	Online crowdsourcing platform – MTurk	No
Durak-Batigun et al., 2018 [8] – Sample 1	CS	Turkey	250	49.6	36.6±14.3	NR	Community sample	NR	Yes (individuals with current/recently diagnosed mental illness were excluded)
Durak-Batigun et al., 2018 [8] – Sample 2	CS	Turkey	360	61.1	36.5±13.6	NR	Community sample	NR	Yes (individuals with current/recently diagnosed mental illness were excluded)
Jokić-Begić et al., 2019 [9] – Sample 1	SCS-7	Croatia	507	72.2	33.2±12.3	18-71	Community sample using the Internet for health searches	Link to survey on social networks, use of mailing lists and snowball method	No
Jokić-Begić et al., 2019 [9] – Sample 2	SCS-7	Croatia	379	75.5	31.8±10.9	18-71	Community sample using the Internet for health searches	Link to survey on social networks, use of mailing lists and snowball method	No
Jokić-Begić et al., 2019 [9] – Sample 3	CSS, SCS-4	Croatia	594	83.8	30.3±10.4	18-73	Community sample using the Internet for health searches	Link to survey on social networks, use of mailing lists and snowball method	No

González-Rivera et al., 2020 [29]	BCS	Puerto Rico/ USA	320	71.3	37.3±12.1	NR	Community sample	Advertisement paid on social networks	No
Tatli et al., 2019 [30]	CTS	Turkey	1200	42.2	NR	18-35	Community sample	NR	Yes (presence of "any health problem in the previous 6 months" was an inclusion criterion)

NR: Not reported.

† Participation was restricted to English-speaking individuals from Australia, Canada, Ireland, New Zealand, the United Kingdom and the United States of America.

MTurk: Amazon's Mechanical Turk; PROL: Prolific.

UK: United Kingdom; USA: United States of America.

BCS: Brief Cyberchondria Scale; CS: Cyberchondria Scale; CSS: Full, 33-item version of the Cyberchondria Severity Scale; CSS-30: A 30-item version of the Cyberchondria Severity Scale; CSS-15: A 15-item version of the Cyberchondria Severity Scale; CSS-15-Revised: A 15-item version of the Cyberchondria Severity Scale (CSS-15) modified to a 12-item version; CSS-12: A 12-item version of the Cyberchondria Severity Scale; CTS: Cyberchondria Tendency Scale; SCS-7: A preliminary 7-item version of the Short Cyberchondria Scale; SCS-4: Final 4-item version of the Short Cyberchondria Scale.

Table 2. Psychometric properties of the Cyberchondria Severity Scale (CSS) across the studies.

Article/study	Factor structure (identification of factors/subscales)	Correlations between the CSS subscales (excluding MMP subscale)	Correlations between the CSS subscales (excluding MMP subscale) and total CSS score	Internal consistency (Cronbach α), not reporting for the MMP subscale	Total CSS score correlations with other scales	Correlations of the CSS subscales (excluding MMP subscale) with other scales
McElroy & Shevlin, 2014 [3]	Exploratory factor analysis: 1. Compulsion 2. Distress 3. Excessiveness 4. Reassurance 5. MMP	0.52-0.67	NR	- Total: 0.94 - Compulsion: 0.95 - Distress: 0.92 - Excessiveness: 0.85 - Reassurance: 0.89	- DASS-21 Total: 0.40 - DASS-21 Anxiety: 0.43 - DASS-21 Stress: 0.37 - DASS-21 Depression: 0.24	- DASS-21 Total: 0.29-0.46 - DASS-21 Anxiety: 0.29-0.49 - DASS-21 Stress: 0.27-0.36 - DASS-21 Depression: 0.20-0.34
Fergus, 2014 [19]	Confirmatory factor analysis: 1. Compulsion 2. Distress 3. Excessiveness 4. Reassurance 5. MMP	0.52-0.68	0.75-0.88	- Total: 0.95 - Compulsion: 0.95 - Distress: 0.95 - Excessiveness: 0.87 - Reassurance: 0.88	- SHAI: 0.59 - DOCS: 0.49	- SHAI: 0.33-0.61 - DOCS: 0.27-0.50
Norr et al., 2015 [10]	Confirmatory factor analysis: Bifactor modelling 1. General Cyberchondria Factor 2. Specific Factors (Compulsion, Distress, Excessiveness, Reassurance, MMP)	0.63-0.80	NR	- Total: 0.95 - Subscales: 0.86-0.95	NR	- SHAI Thought Intrusion: 0.34-0.49 - SHAI Fear of Illness: 0.36-0.52
Norr et al., 2015 [11]	NR	NR	NR	- Total: 0.95 - Subscales: 0.86-0.95	- SHAI: 0.53 - ASI-3: 0.57 - IUS-12 Prospective: 0.38 - IUS-12 Inhibitory: 0.50	NR
McElroy et al., 2019 [21**]	Exploratory factor analysis: 1. Compulsion 2. Distress 3. Excessiveness 4. Reassurance 5. MMP	0.34-0.54	NR	- Total: NR - Compulsion: 0.93 - Distress: 0.92 - Excessiveness: 0.88 - Reassurance: 0.82	NR	NR

Study	Factor analysis			Reliability (Cronbach α)	Correlations	Correlations (range)
Starcevic et al., 2019 [12]	NR	NR	NR	- Total: 0.95 - Subscales: NR	NR	NR
Newby & McElroy, 2020 [32**]	NR	NR	NR	- Total: 0.96 - Compulsion: 0.96 - Distress: 0.95 - Excessiveness: 0.91 - Reassurance: 0.85	NR	NR
Barke et al., 2016 [5] – German version	Principal component analysis: 1. Compulsion 2. Distress 3. Excessiveness 4. Reassurance 5. MMP	0.26-0.59	0.65-0.85	- Total: 0.93 - Compulsion: 0.90 - Distress: 0.87 - Excessiveness: 0.74 - Reassurance: 0.76	- mSHAI: 0.59 - PHQ-15: 0.40 - CES-D: 0.31 - HCU: 0.29	- mSHAI: 0.28-0.65 - PHQ-15: 0.23-0.37 - CES-D: 0.09-0.33 - HCU: 0.18-0.25
Bajcar et al., 2019 [13*] † – Polish version	Confirmatory factor analysis: 1. Compulsion 2. Distress 3. Excessiveness 4. Reassurance 5. MMP	0.61-0.75	0.78-0.89	- Total: 0.95 - Compulsion: 0.88 - Distress: 0.92 - Excessiveness: 0.87 - Reassurance: 0.80	- SHAI Total: 0.56 - SHAI Illness Likelihood: 0.53 - SHAI Negative Consequences of Illness: 0.33 - DOCS Total: 0.38 - DOCS Contamination: 0.21 - DOCS Responsibility: 0.44 - DOCS Unacceptable Thoughts: 0.29 - DOCS Symmetry: 0.30	- SHAI Total: 0.36-0.59 - SHAI Illness Likelihood: 0.36-0.56 - SHAI Negative Consequences of Illness: 0.19-0.39 - DOCS Total: 0.23-0.43 - DOCS Contamination: 0.17-0.22 - DOCS Responsibility: 0.29-0.48 - DOCS Unacceptable Thoughts: 0.14-0.32 - DOCS Symmetry: 0.17-0.34
Uzun & Zencir, 2018 [14] †† – Turkish version	Confirmatory factor analysis: 1. Compulsion 2. Distress 3. Excessiveness 4. Reassurance 5. MMP	NR	NR	- Total: 0.89 - Subscales: 0.65-0.85 (Cronbach α value for the MMP subscale is not reported, but is included in this range)	- DASS-21 Total: 0.33 - DASS-21 Anxiety: 0.31 - DASS-21 Stress: 0.33 - DASS-21 Depression: 0.22	- DASS-21 Total: 0.17-0.33 - DASS-21 Anxiety: 0.15-0.30 - DASS-21 Stress: 0.19-0.33 - DASS-21 Depression: 0.08-0.23
Selvi et al., 2018 [15] – Turkish version	Confirmatory factor analysis: 1. Compulsion 2. Distress 3. Excessiveness 4. Reassurance 5. MMP	0.53-0.80	0.72-0.83	- Total: 0.91 - Subscales: 0.78-0.87	- IAT: 0.45 - HAI: 0.23 - ASI-3: 0.39	- IAT: 0.34-0.43 - HAI: 0.07-0.32 - ASI-3: 0.25-0.40
Zangoulechi et al., 2018	NR	NR	NR	NR	- MOCI subscales: 0.27-0.40 - ASI-R subscales: 0.17-0.38	NR

[16] – Iranian version					- IUS Prospective: 0.34 - IUS Inhibitory: 0.39	
Jokić-Begić et al., 2019 [9] – Croatian version	NR	NR	NR	- Total: 0.91 - Compulsion: 0.91 - Distress: 0.91 - Excessiveness: NR - Reassurance: NR	NR	NR

NR: Not reported.

† Test-retest reliability figures for CSS subscales ranging from 0.58 to 0.76 reported over a period of 3 months in 59 participants.
†† Test-retest reliability figures for CSS subscales ranging from 0.53 to 0.71 and for total CSS score of 0.65 reported over a period of 2 weeks in 66 participants.

MMP: Mistrust of Medical Professionals.

ASI-3: Anxiety Sensitivity Index-3; ASI-R: Anxiety Sensitivity Index Revised; CES-D: Center for Epidemiologic Studies Depression Scale; DASS-21: Depression, Anxiety and Stress Scale – 21-Item Version; DOCS: Dimensional Obsessive-Compulsive Scale; HAI: Health Anxiety Inventory; HCU: Health Care Utilization Questionnaire; IAT: Internet Addiction Test; IUS: Intolerance of Uncertainty Scale; IUS-12: Intolerance of Uncertainty Scale – Short Form; MOCI: Maudsley Obsessive-Compulsive Inventory; mSHAI: Modified Version of the Short Health Anxiety Inventory; PHQ-15: Patient Health Questionnaire; SHAI: Short Health Anxiety Inventory.

Table 3. Status of the Mistrust of Medical Professionals (MMP) subscale of the Cyberchondria Severity Scale (CSS).

Article/study	Internal consistency of the MMP subscale (Cronbach α)	Correlations between the MMP subscale and other CSS subscales	Correlations between the MMP subscale and total CSS score	Correlations between the MMP subscale and other scales of relevance for validity	Recommendations/suggestions/comments about the suitability of the MMP subscale
McElroy & Shevlin, 2014 [3]	0.75	-0.04 to 0.23	NR	- DASS-21 Total: 0.15 - DASS-21 Anxiety: 0.14 - DASS-21 Stress: 0.16 - DASS-21 Depression: 0.09	- None.
Fergus, 2014 [19]	0.87	-0.01 to 0.27	0.26	- SHAI: 0.21 - DOCS: 0.11	- It does not assess the same construct as the other 4 CSS subscales.
Norr et al., 2015 [10]	NR	<0.01 to 0.28	NR	- SHAI Thought Intrusion: 0.01 - SHAI Fear of Illness: -0.08	- Consider as a construct distinct from cyberchondria as measured by the CSS. - Consider removal from the CSS.
Norr et al., 2015 [11]	0.81	NR	0.12†	- SHAI: -0.02 - ASI-3: -0.001 - IUS-12 Prospective: 0.07 - IUS-12 Inhibitory: -0.10	- "Future research should attempt to further clarify the role of the MMP factor with regard to cyberchondria as a construct."
McElroy et al., 2019 [21**]	0.64	-0.16 to 0.26	NR	NR	- Items from this subscale were excluded from the short form of the CSS due to low internal consistency and nonsignificant and weak correlations with all of the other four subscales of the CSS.
Newby & McElroy, 2020 [32**]	0.81	NR	NR	NR	- Reductions in health anxiety after treatment were partly mediated by reductions in cyberchondria severity, except for scores on the MMP subscale.
Barke et al., 2016 [5] – German version	0.89	0.03-0.21	0.34	- mSHAI: 0.13 - PHQ-15: 0.10 - CES-D: 0.11 - HCU: 0.09	- It does not seem to be a part of the CSS construct. - Propose to "drop" it from the CSS.
Bajcar et al., 2019 [13*] – Polish version	0.62	-0.08 to 0.08	0.15	- SHAI Total: 0.08 - SHAI Illness Likelihood: 0.07 - SHAI Negative Consequences of Illness: 0.06 - DOCS Total: 0.07 - DOCS Contamination: 0.02 - DOCS Responsibility: 0.05 - DOCS Unacceptable Thoughts: 0.06 - DOCS Symmetry: 0.08	- Excluded from the cyberchondria model. - Potentially theoretically related to cyberchondria. - May be considered a "control variable".

Uzun & Zencir, 2018 [14] – Turkish version	NR	NR	NR	- DASS-21 Total: 0.09 - DASS-21 Anxiety: 0.14 - DASS-21 Stress: 0.02 - DASS-21 Depression: 0.09	- "Seems unnecessary to the CSS construct". - Consider removal from the CSS.
Selvi et al., 2018 [15] – Turkish version	0.64	-0.05 to 0.44	0.41	- IAT: -0.07 - HAI: 0.01 - ASI-3: 0.02	- None.
Jokić-Begić et al., 2019 [9] – Croatian version	0.68	NR	NR	NR	- None.

NR: Not reported.

† Total CSS score does not include items of the MMP subscale.

ASI-3: Anxiety Sensitivity Index-3; CES-D: Center for Epidemiologic Studies Depression Scale; DASS-21: Depression, Anxiety and Stress Scale – 21-Item Version; DOCS: Dimensional Obsessive-Compulsive Scale; HAI: Health Anxiety Inventory; HCU: Health Care Utilization Questionnaire; IAT: Internet Addiction Test; IUS-12: Intolerance of Uncertainty Scale – Short Form; mSHAI: Modified Version of the Short Health Anxiety Inventory; PHQ-15: Patient Health Questionnaire; SHAI: Short Health Anxiety Inventory.

Table 4. Psychometric properties of the shorter/modified versions of the Cyberchondria Severity Scale (CSS) across the studies.

Article/study	Correlations between the CSS subscales	Correlations between the CSS subscales and total CSS score	Internal consistency (Cronbach α)	Total CSS score correlations with other scales	Correlations of the CSS subscales with other scales
CSS-30 (Fergus, 2014) [19]	NR	0.78-0.88	- Total: 0.96	- SHAI: 0.58 - DOCS: 0.49	NR
CSS-30 (Fergus, 2015) [33]	0.45-0.66	0.78-0.88	- Total: 0.95 - Compulsion: 0.95 - Distress: 0.95 - Excessiveness: 0.87 - Reassurance: 0.88	- Whiteley Index: 0.62 - ASI-3-Physical: 0.55 - ASI-3-Cognitive: 0.55 - ASI-3-Social: 0.40 - IUS-12-Inhibitory: 0.47 - IUS-12-Prospective: 0.33	- Whiteley Index: 0.38-0.65 - ASI-3-Physical: 0.33-0.59 - ASI-3-Cognitive: 0.35-0.53 - ASI-3-Social: 0.21-0.39 - IUS-12-Inhibitory: 0.24-0.49 - IUS-12-Prospective: 0.17-0.36
CSS-30 (Norr et al., 2015) [34]	0.61-0.78	NR	-Total and subscales: 0.86-0.97	NR	- SHAI: 0.39-0.60 - DOCS-Contamination: 0.33-0.45 - DOCS-Harm Avoidance: 0.36-0.55 - DOCS-Unacceptable Thoughts: 0.28-0.41 - DOCS-Symmetry: 0.29-0.40 - PANAS-NA: 0.23-0.43
CSS-30 (Fergus & Spada, 2017) [6]	NR	NR	- Total: 0.95 - Subscales: NR	- PIUQ: 0.59 - Whiteley Index - 6: 0.67 - ASI-3-Physical: 0.64 - ASI-3-Cognitive: 0.62 - ASI-3-Social: 0.52 - IUS-12-Inhibitory: 0.52 - IUS-12-Prospective: 0.44 - PANAS-NA: 0.58 - MCQ-HA-U: 0.66 - MCQ-HA-B: 0.58 - MCQ-HA-C: 0.49	NR
CSS-30 (Fergus & Spada, 2018) [7]	NR	NR	- Total: 0.95 - Subscales: NR	- Whiteley Index - 6: 0.56 - ASI-3-Physical: 0.37 - ASI-3-Cognitive: 0.44 - ASI-3-Social: 0.35 - IUS-12-Inhibitory: 0.31 - IUS-12-Prospective: 0.24 - PANAS-NA: 0.34	NR

				- MCQ-HA-U: 0.51 - MCQ-HA-B: 0.49 - MCQ-HA-C: 0.32 - BARI: 0.49 - SSQ: 0.33	
CSS-30 (Fergus & Russell, 2016) [35]	0.42-0.61	0.73-0.86	- Total: NR - Subscales: 0.86-0.96	- MIHT-Affective: 0.57 - MIHT-Cognitive: 0.46 - MIHT-Perceptual: 0.13 - MIHT-Behavioural: 0.32 - DOCS-Contamination: 0.41 - DOCS-Responsibility: 0.44 - DOCS-Thoughts: 0.32 - DOCS-Symmetry: 0.26 - PANAS-NA: 0.31	- MIHT-Affective: 0.27-0.62 - MIHT-Cognitive: 0.22-0.46 - MIHT-Perceptual: -0.05-0.28 - MIHT-Behavioural: 0.15-0.32 - DOCS-Contamination: 0.22-0.43 - DOCS-Responsibility: 0.18-0.48 - DOCS-Thoughts: 0.08-0.35 - DOCS-Symmetry: 0.14-0.27 - PANAS-NA: 0.14-0.30

CSS-30
(Mathes et al.,
2018) [20] †
	0.50-0.75	NR	- Total: 0.96
			- Compulsion: 0.96
			- Distress: 0.95
			- Excessiveness: 0.87
			- Reassurance: 0.85
				NR	- SHAI Thought Intrusion: 0.34-0.49
					- SHAI Fear of Illness: 0.33-0.52
					- WHOQOL-Physical Health:
					  -0.24 to -0.17
					- WHOQOL-Psychological Health:
					  -0.24 to -0.10
					- WHOQOL-Social Relationships:
					  -0.20 to -0.05
					- WHOQOL-Environment:
					  -0.22 to -0.10
					- SDS Occupational Functioning:
					  0.42-0.70
					- SDS Social Functioning: 0.41-0.70
					- SDS Family Functioning: 0.45-0.73
					- Physical Health Care Utilisation:
					  0.19-0.33
					- Mental Health Care Utilisation:
					  0.11-0.25

CSS-30 (Gibler et al., 2019) [36]	0.64-0.71	0.82-0.89	-Total and subscales: 0.83-0.96	- SHAI: 0.58 - PCS Total: 0.52 - PANAS-NA: 0.44	- SHAI: 0.43-0.55 - PCS Total: 0.38-0.50 - PANAS-NA: 0.30-0.43
CSS-30 – Polish version	NR	0.80-0.90	- Total: 0.95 - Subscales: NR	- SHAI Total: 0.56 - SHAI Illness Likelihood: 0.52 - SHAI Negative Consequences of Illness: 0.33	NR

				- DOCS Total: 0.38 - DOCS Contamination: 0.22 - DOCS Responsibility: 0.44 - DOCS Unacceptable Thoughts: 0.28 - DOCS Symmetry: 0.30	
(Bajcar et al., 2019) [13*] ††					
CSS-30 – Polish version (Bajcar & Babiak, 2019) [37]	NR	NR	- Total: 0.95 - Subscales: NR	- SHAI: 0.52 - DOCS: 0.41 - RSES: -0.25	NR
CSS-15 – German version (Barke et al., 2016) [5] †††	0.02-0.45	0.30-0.76	- Total: 0.82 - Compulsion: 0.86 - Distress: 0.83 - Excessiveness: 0.71 - Reassurance: 0.67 - Mistrust of Medical Professionals: 0.69	- mSHAI: 0.57 - PHQ-15: 0.35 - CES-D: 0.28	- mSHAI: 0.18-0.61 - PHQ-15: 0.08-0.31 - CES-D: 0.08-0.31
CSS-15-Revised (Fergus & Spada, 2018) [7]	NR	NR	- Total: 0.88 - Subscales: NR	- Whiteley Index - 6: 0.61 - DOCS: 0.56 - MCQ-HA-U: 0.64 - MCQ-HA-B: 0.47 - MCQ-HA-C: 0.40 - BARI: 0.58 - SSQ: 0.36 - BFI-2-XS-N: 0.41	NR
CSS-12 (McElroy et al., 2019) [21**] ††††	NR	NR	- Total: 0.90 - Compulsion: 0.87 - Distress: 0.87 - Excessiveness: 0.83 - Reassurance: 0.73	- SHAI: 0.53 - GAD-7: 0.30	NR

NR: Not reported.

† The factor structure of the 30-item version of the CSS (Mathes et al., 2018) comprised 4 factors/subscales identified by means of confirmatory factor analysis: 1) Compulsion; 2) Distress; 3) Excessiveness; 4) Reassurance. However, bifactor modelling with General Cyberchondria factor and Specific factors was the best-fitting model.
†† The factor structure of the 30-item version of the CSS (Bajcar et al., 2019) comprised 4 factors/subscales identified by means of confirmatory factor analysis: 1) Compulsion; 2) Distress; 3) Excessiveness; 4) Reassurance.
††† The factor structure of the CSS-15 comprised 5 factors/subscales identified by means of confirmatory factor analysis: 1) Compulsion; 2) Distress; 3) Excessiveness; 4) Reassurance; 5) Mistrust of Medical Professionals.

††††† The factor structure of the CSS-12 comprised 4 factors/subscales identified by means of exploratory factor analysis: 1) Compulsion; 2) Distress; 3) Excessiveness; 4) Reassurance.

CSS-30: 30-item version of the Cyberchondria Severity Scale; CSS-15: 15-item version of the Cyberchondria Severity Scale; CSS-15-Revised: 15-item version (CSS-15) of the Cyberchondria Severity Scale modified to a 12-item version; CSS-12: 12-item version of the Cyberchondria Severity Scale.

ASI-3: Anxiety Sensitivity Index-3; BARI: Beliefs about Rituals Inventory; BFI-2-XS-N: Big Five Inventory-2-Extra Short Neuroticism Scale; CES-D: Center for Epidemiologic Studies Depression Scale; DOCS: Dimensional Obsessive-Compulsive Scale; GAD-7: Generalized Anxiety Disorder 7-Item Scale; IUS-12: Intolerance of Uncertainty Scale – Short Form; MCQ-HA-B: Metacognitions Questionnaire – Health Anxiety – Biased Thinking; MCQ-HA-C: Metacognitions Questionnaire – Health Anxiety – Thoughts Can Cause Illness; MCQ-HA-U: Metacognitions Questionnaire – Health Anxiety – Thoughts Are Uncontrollable; MIHT: Multidimensional Inventory of Hypochondriacal Traits; mSHAI: Modified Version of the Short Health Anxiety Inventory; PANAS-NA: Positive and Negative Affect Schedule – Negative Affect; PCS: Pain Catastrophizing Scale; PHQ-15: Patient Health Questionnaire; PIUQ: Problematic Internet Use Questionnaire; RSES: Rosenberg Self-Esteem Scale; SDS: Sheehan Disability Scale; SHAI: Short Health Anxiety Inventory; SSQ: Stop Signals Questionnaire; WHOQOL: World Health Organisation Quality of Life Assessment.

Table 5. Cyberchondria scales other than the Cyberchondria Severity Scale and its modifications.

Scale	Country of origin	Number of items	Response format	Cut-off point and/or scoring details	Factor structure (identification of factors/subscales)	Internal consistency (Cronbach α)	Correlations with other scales
CS [8]	Turkey	27	5-point	NR	Exploratory factor analysis and confirmatory factor analysis: 1. Anxiety-Increasing Factors 2. Compulsion/Hypochondria 3. Anxiety-Reducing Factors 4. Physician-Patient Interaction 5. Non-Functional Internet Usage	- Total: 0.93 - Anxiety-Increasing Factors: 0.88 - Compulsion/Hypochondria: 0.83 - Anxiety-Reducing Factors: 0.80 - Physician-Patient Interaction: 0.80 - Non-Functional Internet Usage: 0.84	Total score correlations: - INAS: 0.43 (subscale correlations: 0.25-0.44) - HAI: 0.53 (subscale correlations: 0.23-0.64) - BSI: 0.33 (subscale correlations: 0.10-0.41)
SCS [9]	Croatia	4	5-point	NR	Exploratory factor analysis and confirmatory factor analysis: One factor/dimension	- 0.73	- CSS: NR - HAQ: 0.48*; 0.53* - ASI: 0.35*; 0.51*
BCS [29]	Puerto Rico/USA	10	5-point	0-7: Minimal symptoms 8-13: Mild symptoms 14-24: Moderate symptoms 25-40: Severe symptoms	Exploratory factor analysis: 1. Online Health Information Search 2. Health Anxiety	- Total: 0.92 - Subscales: NR	Total score correlations: - IAS: 0.68 - GAD-7: 0.43
CTS [30]	Turkey	30	5-point	30-60: Low level of cyber-chondria tendencies (CT) 60-90: Moderate level of CT 90-120: High level of CT	Exploratory factor analysis and confirmatory factor analysis: 1. Reflection 2. Information Seeking	- Total: 0.94 - Reflection: 0.94 - Information seeking: 0.87	NR

NR: Not reported.

* These correlations were based on the longer (7-item) version of the Short Cyberchondria Scale.

BCS: Brief Cyberchondria Scale; CS: Cyberchondria Scale; CTS: Cyberchondria Tendency Scale; SCS: Short Cyberchondria Scale.

ASI: Anxiety Sensitivity Index; BSI: Brief Symptom Inventory; CSS: Cyberchondria Severity Scale; GAD-7: Generalized Anxiety Disorder 7-Item Scale; HAI: Health Anxiety Inventory; HAQ: Health Anxiety Questionnaire; IAS: Illness Anxiety Scale; INAS: Internet Addiction Scale.