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Authors

Grubbs, Joshua
Reid, Rory
Bőthe, Beáta
et al.

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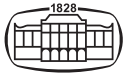
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Assessing compulsive sexual behavior disorder: The development and international validation of the compulsive sexual behavior disorder-diagnostic inventory (CSBD-DI)

JOSHUA B. GRUBBS[1]* , RORY C. REID[2] ,
BEÁTA BŐTHE[3,4] , ZSOLT DEMETROVICS[5,6] ,
ELI COLEMAN[7] , NEIL GLEASON[8] ,
MICHAEL H. MINER[7] , JOHANNES FUSS[9] ,
VERENA KLEIN[10] , KAROL LEWCZUK[11] ,
MATEUSZ GOLA[12,13] , DAVID P. FERNANDEZ[14] ,
ELAINE F. FERNANDEZ[15], STEFANIE CARNES[16],
MICHAL LEW-STAROWICZ[17] , DREW KINGSTON[18,19] and
SHANE W. KRAUS[20]

[1] Bowling Green State University, Bowling Green, Ohio, USA

[2] University of California Los Angeles, Los Angeles, California, USA

[3] Université du Québec à Trois-Rivières, Trois-Rivières, Quebec, Canada

[4] Université de Montréal, Montreal, Quebec, Canada

[5] Institute of Psychology, ELTE Eötvös Loránd University, Budapest, Hungary

[6] Centre of Excellence in Responsible Gaming, University of Gibraltar, Gibraltar, Gibraltar

[7] University of Minnesota, Minneapolis, Minnesota, USA

[8] University of Washington, Seattle, Washington, USA

[9] University of Duisburg-Essen, Duisburg, Germany

[10] School of Psychology, University of Southampton, UK

[11] Cardinal Stefan Wyszynski University in Warsaw, Poland

[12] University of California San Diego, San Diego, California, USA

[13] Institute of Psychology, Polish Academy of Sciences, Poland

[14] Nottingham Trent University, Nottingham, United Kingdom

[15] Independent Practice

[16] International Institute for Trauma and Addiction Professionals, Carefree, Arizona, USA

[17] Department of Psychiatry, Centre of Postgraduate Medical Education, Warsaw, Poland

[18] Institute of Mental Health Research, Royal Ottawa Health Care Group, Ottawa, ON, Canada

[19] Department of Psychiatry, McMaster University, Hamilton, ON, Canada

[20] University of Nevada Las Vegas, Las Vegas, Nevada, USA

*Corresponding author.
E-mail: JoshuaGrubbsPhD@gmail.com

ABSTRACT

Background and aims: The World Health Organization's *International Classification of Diseases* (ICD-11) includes Compulsive Sexual Behavior Disorder (CSBD), a new diagnosis that is both controversial and groundbreaking, as it is the first diagnosis to codify a disorder related to excessive, compulsive, and out-of-control sexual behavior. The inclusion of this novel diagnosis demonstrates a clear need for valid assessments of this disorder that may be quickly administered in both clinical and research settings.

Design: The present work details the development of the Compulsive Sexual Behavior Disorder Diagnostic Inventory (CSBD-DI) across seven samples, four languages, and five countries. *Setting:* In the first study, data were collected in community samples drawn from Malaysia ($N = 375$), the U.S. ($N = 877$), Hungary ($N = 7,279$), and Germany ($N = 449$). In the second study, data were collected from nationally representative samples in the U.S. ($N = 1,601$), Poland ($N = 1,036$), and Hungary ($N = 473$). *Findings:* Across both studies and all samples, results revealed strong psychometric qualities for the 7-item CSBD-DI, demonstrating evidence of validity via correlations with key behavioral indicators and longer measures of compulsive sexual behavior. Analyses from nationally representative samples revealed residual metric invariance across languages, scalar invariance across gender, strong evidence of validity, and utility in classifying individuals who self-identified as having problematic and excessive sexual behavior, as evidenced by ROC analyses revealing suitable cutoffs for a screening instrument. *Conclusion:* Collectively, these findings demonstrate the cross-cultural utility of the CSBD-DI as a novel measure for CSBD and provide a brief, easily administrable instrument for screening for this novel disorder.

The eleventh edition of the World Health Organization's *International Classification of Diseases* (hereafter, ICD-11) brings many changes to psychiatric diagnoses. Among the starkest of those changes has been the inclusion of the novel diagnosis of Compulsive Sexual Behavior Disorder (CSBD) as an impulse control disorder. Though controversial, CSBD's inclusion represents a turning point in the conceptualization and understanding of dysregulated, excessive, or out-of-control sexual behaviors. Even so, CSBD presents unique challenges related to diagnosis, highlighting a need for empirically validated assessments that accurately identify people who may need a further evaluation to confirm the presence of the disorder. The present study aims to address that need through the cross-cultural development of a brief screening measure for CSBD.

COMPULSIVE SEXUAL BEHAVIOR DISORDER IN ICD-11

Though the potential for people to experience out-of-control sexual behavior has been documented for millennia, it was only in the late 20th century when mental health disciplines began to consider such behavior as a clinical syndrome (Coleman, 1987, 1991; Orford, 1978; Quadland, 1985). Research related to out-of-control sexual behavior increased exponentially in the wake of the proposed diagnosis of Hypersexual Disorder (HD) for the American Psychiatric Association's *Diagnostic and Statistical Manual of Mental Disorders – 5* (DSM-5). Although HD was extensively researched, scrutinized, and part of a successful field trial (Reid et al., 2012), the proposed disorder was ultimately excluded from the DSM-5.

In 2018, the World Health Organization's Working Group on Impulse Control Disorders formally proposed the new diagnosis of CSBD for inclusion in the then-upcoming ICD-11 (Kraus et al., 2018). The CSBD criteria (See Table A1 in Appendix B), like the HD criteria before, focus on diminished control over non-paraphilic sexual behaviors as evidenced by engagement in those behaviors while neglecting other important life domains, multiple unsuccessful attempts to reduce sexual behaviors, and persistence in sexual behaviors despite negative consequences. In contrast with the criteria for HD, CSBD omitted references to the use of sexual behavior to cope with, avoid, or escape negative emotions. Moving further, based on a body of literature demonstrating that moral disapproval can lead to inaccurate self-perceptions of sexual compulsivity (Grubbs, Perry, Wilt, & Reid, 2019), the CSBD criteria emphasize that distress related to moral disapproval of one's own sexual behavior alone (i.e., as opposed to impairment and distress due to actual dysregulation) is insufficient for the diagnosis. Finally, persistence in sexual behaviors despite a lack of or decrease in satisfaction deriving from those behaviors was also introduced as a new aspect of the CSBD diagnostic criteria in ICD-11.

Importantly, in addition to being a psychiatric disorder in its own right, symptoms of CSBD are also associated with a range of psychiatric comorbidities including anxiety (Grant Weinandy, Lee, Hoagland, Grubbs, & Bőthe, 2022), general emotional dysregulation (Lew-Starowicz, Lewczuk, Nowakowska, Kraus, & Gola, 2020), depression (Grubbs, Perry, Grant Weinandy, & Kraus, 2022), and substance use disorders (Ballester-Arnal, Castro-Calvo, Giménez-García, Gil-Juliá, & Gil-Llario, 2020). That is, CSBD is often associated with a cluster of other concerning psychiatric phenomena, underscoring the need to screen for this disorder in a range of clinical settings.

EXISTING MEASURES OF COMPULSIVE SEXUAL BEHAVIOR

As past works have noted (Grubbs et al., 2020), there are many assessments available to assess self-reported out-of-control sexual behaviors. Among clinically validated measures, the Hypersexual Behavior Inventory-19 (HBI-19) (Reid, Garos, & Carpenter, 2011) has proven to be extremely popular, due in large part to its development with and correspondence to the criteria for HD. Similarly, another well-validated measure of out-of-control sexual behaviors is the 13-item Compulsive Sexual Behavior Inventory (CSBI-13) (Miner, Raymond, Coleman, & Swinburne Romine, 2017). However, both the HBI-19 and CSBI-13 were developed before the CSBD criteria were proposed and include items that assess symptoms not included in the CSBD criteria.

Of currently available measures, only one has been developed explicitly in reference to the CSBD criteria in ICD-11: The Compulsive Sexual Behavior Disorder Scale (CSBD-19) (Bőthe, Potenza, et al., 2020). This 19-item measure assesses symptoms of CSBD across five domains and has demonstrated

clear utility across languages and in numerous cultural settings. Scores of 50 or higher are indicative of clinically elevated levels of compulsive sexual behaviors (CSBs) and present a need for full clinician-based screening for CSBD. Even so, this scale is lengthy at 19 items and is slightly complex to score given the subscales, which may preclude its use as a brief screening instrument in medical settings or representative studies, where time is limited. See Supplemental Table 1 for details regarding how these previously developed measures correspond to criteria for HD and CSBD.

Given the above, the primary purpose of the present work was to develop a brief, easily administrable, and quickly scorable instrument that fully covered all CSBD symptoms, which we termed the *Compulsive Sexual Behavior Disorder Diagnostic Inventory* (CSBD-DI). Details regarding how this measure was developed are available in the Measures section, below. We tested this newly developed CSBD-DI two studies (Study 1 using convenience sampling methods and Study 2 using nationally representative samples) across seven cross-sectional samples in five countries and four languages, as detailed below.

STUDY 1

Method

Participants and procedure

Demographics for all samples are available in Table 1. All participants were at least 18 years old and provided informed consent.

Sample 1. English-speaking undergraduate students enrolled in courses at a large private university in Malaysia (N = 375) completed the study in English.

Sample 2. Adults in the United States (N = 877) recruited via Amazon's Mechanical Turk service completed the study in English.

Sample 3. Hungarian adults (N = 7,279), recruited from a large news portal, completed key measures in Hungarian, with measures translated from English to Hungarian using established guidelines (Beaton, Bombardier, Guillemin, & Ferraz, 2000). Specifically, two independent translations were conducted from English into the target language, followed by translation discussion and synthesis, a separate back-translation from the target language into English, adjustment and confirmation of a consensus version by the team of researchers, and pre-testing among native speakers of the target language to confirm item comprehension.

Sample 4. German adults (N = 449), recruited via internet forums of health care and medical websites, as well as social media, completed the study in German, with measures translated from English to German using established guidelines as noted above.

Measures

CSBD-DI. Development. The primary measure of focus was the CSBD-DI. This measure was developed by the

Table 1. Demographics for each sample

	Study 1				Study 2		
	Sample 1	Sample 2	Sample 3	Sample 4	Sample 1	Sample 2	Sample 3
Country	Malaysia	United States	Hungary	Germany	United States	Poland	Hungary
Sample Size	N = 375	N = 877	N = 7,279	N = 449	N = 1,601	N = 1,036	N = 473
Gender	74% women	48.9% women	33.4% women	58.8% women, 40.3% men, 0.9% other.	53.3% women	51% women	50.1% women
Mean Age (SD)	20.80 (1.47)	41.83 (13.92)	35.79 (12.23)	27.42 (7.67)	50.29 (17.26)	43.28 (14.21)	39.30 (12.22)
Sexual Orientation	heterosexual (79.8%), followed by bisexual (10.1%), Gay/Lesbian (2.9%), pansexual (3.7%), asexual (1.3%), and other/ prefer-not-to-say (2.1%).	heterosexual (85.7%), followed by bisexual (7.4%), Gay/Lesbian (4.2%), pansexual (0.9%), asexual (1.0%), and other/ prefer-not-to-say (0.8%).	heterosexual (81.3%), followed by bisexual (14%), Gay/Lesbian (3.1%), asexual (0.4%), and other/ unsure/prefer-not-to-say (1.3%).	–	–	heterosexual (87%), with 5.8% of the sample identifying as exclusively gay or lesbian, and 7.2% identifying as at least somewhat bisexual.	–

authorship team for the present study using the following procedure. In fall of 2018, prior to the official inclusion of CSBD in the ICD-11 and pre-dating any other measures of CSBD (e.g., CSBD-19; Bőthe, Potenza, et al., 2020), three doctoral-level subject-matter-experts reviewed available measures of out-of-control sexual behavior, as well as the proposed diagnostic criteria of CSBD for the ICD-11 and the proposed criteria of HD for the DSM-5. Based on this review, a novel, 9-item measure was generated assessing the presence of symptoms during the past 6 months, of which, six items reflected shared symptoms of both CSBD and HD (e.g., loss of control; preoccupation; failed attempts to stop; persistence despite adverse consequences), one item assessing a criterion unique to CSBD (persistence despite a lack of pleasure), and two items assessing criteria unique to HD (using sex to cope with stress or negative affect). This measure was developed to directly assess the criteria of HD and CSBD as they were written, rather than by traditional item-bank reduction approaches or via exploratory factor analysis. That is, we sought to take a confirmatory approach to developing this measure using face-valid items that directly mirrored clear diagnostic criteria. The 9-item measure was then distributed among a larger team of doctoral-level clinical psychologists, psychiatrists, neuroscientists, and researchers with expertise in behavioral addictions who provided feedback regarding the structure of the scale and its corresponding items. This produced in minor revisions to the scale and resulted in a 9-item inventory of symptoms of both CSBD and HD (see Table 2 and Appendix A for items).

We also tested the possibility that a shorter, 7-item scale may better fit obtained data. Specifically, given that the 9-item measure included two coping items that corresponded to HD criteria only, rather than CSBD criteria, and past work noting that coping related motivations for sexual behavior are not necessarily symptoms of CSB (Bőthe, Potenza, et al., 2020), we sought to compare a 7-item scale that only corresponded to CSBD criteria to the full 9-item version. Full details of this process are described below in our discussion analyses and results.
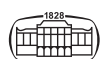
Details. Participants indicated their lifetime experiences with each statement, where the absence (*this has never been true of me*) or historical presence only (*this has been true*

Table 2. Item-level endorsement across all 7 samples

	Study 1				Study 2		
Item	Sample 1 Malaysia (N = 375) Percent Endorsing	Sample 2 United States (N = 877) Percent Endorsing	Sample 3 Hungary (N = 7,279) Percent Endorsing	Sample 4 Germany (N = 449) Percent Endorsing	Sample 1 United States (N = 1,601) Percent Endorsing	Sample 2 Poland (N = 1,036) Percent Endorsing	Sample 3 Hungary (N = 473) Percent Endorsing
1	**14%**	**17%**	**10%**	**6%**	**8%**	**7%**	**7%**
2	**19%**	**13%**	**11%**	**8%**	**7%**	**6%**	**9%**
3	**9%**	**20%**	**9%**	**8%**	**6%**	**5%**	**4%**
4	**10%**	**30%**	**11%**	**7%**	**6%**	**5%**	**5%**
5	**15%**	**18%**	**13%**	**7%**	**7%**	**7%**	**8%**
6	**3%**	**15%**	**7%**	**5%**	**5%**	**5%**	**6%**
7	**21%**	**19%**	**11%**	**8%**	**9%**	**1%**	**8%**
8	38%	32%	25%	20%	–	–	–
9	36%	30%	25%	18%	–	–	–
Sum[b] Mean	0.91	1.71	0.72	0.49	0.48	0.44	0.47
SD	(1.37)	(2.09)	(1.47)	(1.16)	(1.18)	(1.17)	(1.29)
Skew	1.87	1.26	2.55	3.25	2.94	3.5	3.35
Percentiles	90th = 3	90th = 4	90th = 3	90th = 2	90th = 2	90th = 2	90th = 2
	95th = 4	95th = 5	95th = 4	95th = 3	95th = 3	95th = 3	95th = 3

[b] range = 0–7; bolded values represent items included in the final HD-CSBD scale

1. I have spent too much time focused on sexual fantasies, sexual urges, and sexual behaviors to the extent I neglect responsibilities, my health, or personal relationships.

2. I have made numerous unsuccessful attempts to reduce or control the frequency of my sexual fantasies, urges, and behaviors?

3. I often engage in sexual behavior despite the risk of physical harm (e.g. sexually transmitted infection, unintended pregnancy, injury, or illness, etc…)

4. I often engage in sexual behavior despite the risk of emotional harm to myself or others (such as hurting the feelings of a romantic partner, a family member, or close friends).

5. My sexual fantasies, urges, and behavior have often caused significant personal distress in my life (such as feelings of sadness, depression, shame, guilt, regret, worry, hopelessness, etc…)

6. My sexual fantasies, urges, and behavior have often caused significant problems or consequences in my personal relationships with others, in social situations, my work, or other important aspects of my life.

7. I repeatedly engage in sexual behavior even when it gives me little pleasure or satisfaction.

8. (not included in sum) I have often used sexual fantasies, urges, and behaviors to escape or distract myself from unpleasant feelings such as depression, sadness, loneliness, anxiety, boredom, restlessness, shame, irritability, etc…

9. (not included in sum) I have often used sexual fantasies, urges, and behaviors to avoid or cope with stressful experiences in my life.

in my lifetime but not during the last 12 months) were scored as 0, and current endorsement of a symptom (*this has been true for at least 6 months during the last 12 months*) was scored as 1. Responses were summed across the seven retained items (see below for description of this process).

Cross-validation measures. Across samples, we included a variety of measures of CSB based on prior conceptions of out-of-control sexual behaviors. In Sample 1, we included the HBI-19 (Reid et al., 2011) and in Sample 3 we included an 8-item version of the HBI-19 (Reid, 2023; In Preparation). In Sample 2, we included the CSBI-13 (Miner et al., 2017). In Samples 3 and 4, we included the CSBD-19 (Bőthe, Potenza, et al., 2020).

Measures of problematic pornography use. In Sample 1, we included the Cyber-Pornography Use Inventory-4 (CPUI-4) (Grubbs & Gola, 2019), and the Brief Pornography Screen (BPS) (Kraus et al., 2020). In Samples 3 and 4, we included the Problematic Pornography Consumption Scale-6 (PPCS-6) (Bőthe et al., 2021). Each of the above are well-validated brief screening measures meant to assess excessive, compulsive, or dysregulated use of pornography, which is likely the most common form of compulsive sexual behavior (Grubbs et al., 2020; Reid et al., 2012).

Self-reported behaviors. In Sample 1, we assessed past year sexual frequency, past year pornography viewing frequency, and past-year masturbation frequency on a scale of 1 (*never*) to 8 (*once a day or more*), as well as lifetime number of sexual partners. In Samples 3 and 4, we assessed past year frequency (on a scale of 0 = *never* to 10 = *more than 7 times per week*) of casual sex, masturbation, and pornography use, as well as lifetime number of sexual partners.

Mental health and psychological distress. In Sample 1, we included the Patient Health Questionnaire-4 (PHQ-4) (Kroenke, Spitzer, Williams, & Löwe, 2009), a four-item measure of general psychological distress in the form of anxiety and depression. In Sample 1, we also included the Suicidal Behaviors Questionnaire-Revised (SBQ-R) (Osman et al., 2001).

In Samples 3 and 4, we included the Depression and Anxiety subscales of the Brief Symptom Inventory-18 (Derogatis, 2001).

Analytic plan

In all samples, we used the *psych* (Revelle, 2014, p. 165) package for R statistical software to generate descriptive statistics and measures of internal consistency for all items of the CSBD-DI and for key measures.

Initial analyses of scale structure were conducted using the *lavaan* package for R Statistical Software (Rosseel, 2012). Specifically, we conducted confirmatory factor analysis (CFA) of the 9-item scale. Additionally, given the theoretical ambiguities of including two coping items (i.e., these two items corresponded to HD criteria only, rather than CSBD criteria) and past work noting that coping related motivations for sexual behavior are not necessarily symptoms of

CSB (Bőthe, Potenza, et al., 2020), we also tested a 7-item scale that omitted coping related items from the CSBD-DI. CFAs relied on an unifactorial solution. All analyses made use of robust (mean-adjusted test statistic) diagonally weighted least squares estimation (signified by the abbreviation, WLSM). Fit was evaluated by examining a number of indicators, including chi-square values, robust root mean square error of approximation (RMSEA), robust confirmatory fit indices (CFI), robust Tucker-Lewis indices (TLI), and Standardized Root Mean Squared Residual (SRMR), and indexing against conventional cutoffs for acceptable fit (i.e., CFI > 0.95, TLI > 0.95, RMSEA < 0.08, SRMR < 0.06; Hu & Bentler, 1999), while noting that simple cutoffs for interpreting fit are problematic in general (Marsh, Hau, & Wen, 2004; Nye & Drasgow, 2011) and especially so for WLSM estimation (DiStefano & Morgan, 2014; Nye & Drasgow, 2011; Padgett & Morgan, 2021). More simply, we evaluated multiple indices of fit across samples, with a goal of selecting the model that provided the best fit across samples.

Following refinement and confirmation of factor structure, CSBD-DI sum scores were calculated and correlated with self-reported behavioral measures in all four samples and with other key scales using the *psych* package for R Statistical Software. For all correlations, we used Pearson correlations with Holm-correction when evaluating statistical significance to control family-wise error rates (Revelle, 2014, p. 165). We also used recently established conventions (Funder & Ozer, 2019) regarding correlational effect sizes so that correlations greater than 0.10 but less than 0.20 were considered small, correlations between 0.20 and 0.30 were considered medium, correlations between 0.30 and 0.40 were considered large, and correlations greater than 0.40 were considered very large. For the purposes of interpretation, correlations greater than 0.40 (i.e., very large; Funder & Ozer, 2019) were taken as evidence of convergent validity, and correlations that were positive but smaller (i.e., 0.10 to 0.40) were taken as evidence of discriminant validity.

Finally, in Samples 3 and 4, given the presence of established, validated measure of CSBD symptoms with a clear screening cutoff (CSBD-19, <50), we conducted Receiver Operator Curve (ROC) analyses in SPSS 25, to determine the sensitive and specificity of the new measure in classifying those who scored above clinical cutoffs on established measures. For interpretation, we used conventional cutoffs (i.e., AUC > 0.70 = acceptable; AUC > 0.8 = good; AUC > 0.9 = excellent) regarding area under the curve (AUC) in ROC analyses (Hosmer Jr et al., 2013).

Ethics

To test the initial psychometric qualities of the novel CSBD-DI, we collected web-based, cross-sectional samples using either convenience or snowball sampling methods across four countries, as detailed below. All data collections were approved by local institutional IRBs, and all participation was anonymous and voluntary.

Results

Samples varied considerably from each other (See Table 1), with Sample 1 (Malaysian undergraduates) being younger (Mean age = 21) and predominantly women (78%), in contrast with other samples that had majority men (Samples 2 and 3, corresponding to U.S. and Hungary). Descriptive statistics for all included scales are shown in Table 3.

Across all nine potential items of the CSBD-DI, relatively similar distributions were noted within all four samples, except for items 8 and 9 which focused on the use of sexual behavior to cope with negative affect (See Table 2). Within each sample, participants endorsed these items at a much a higher level than other items. Accordingly, we evaluated the overall fit of a 7-item version only assessing CSBD criteria, that did not included the two coping items as unconstrained exogenous covariates, in comparison to the original unifactorial 9-item solution. Across all samples, the 7-item version (with coping items as exogenous covariates, rather than indicators of the same latent construct) fit the data considerably better (See Table A2 in Appendix B). Accordingly, we used the 7-item version of the scale (omitting the two coping items entirely) in all further analyses. See Table 4 for CFA results for the 7-items only (omitting them entirely) and internal consistency measures in all samples. With the exception of our undergraduate, Malaysian sample, all items returned standardized loadings at 0.47 or higher, and the internal consistency indices ranged from 0.78–0.82. In Sample 1, all items returned standardized loadings at 0.39 or higher, and internal consistency measures were acceptable ($\alpha = 0.70$, $\omega = 0.68$).

Gender comparisons

As shown in Table A3 in Appendix B, in Samples 1, 3, and 4, men scored significantly higher on the CSBD-DI, though the magnitude of the gender differences on this measure were somewhat small (Cohen's $d < 0.5$). However, in Sample 2, there was no significant gender difference.

Correlations with behavioral self-reports. Across samples, CSBD-DI scores were consistently positively correlated with past year sexual frequency, lifetime sexual partners, masturbation frequency, and pornography-viewing frequency (see Table 5), though these associations were most often small (Funder & Ozer, 2019). In Sample 1, CSBD-DI scores were positively correlated with number of lifetime sexual partners, though the effect size was small. In Sample 2, CSBD-DI scores were positively and moderately correlated with greater number of past year sexual partners, greater past year casual sexual frequency, greater past year pornography use frequency, and greater past year masturbation frequency. Results in Sample 3 and 4 were similar, with both demonstrating very small positive correlations between CSBD-DI scores and lifetime sexual partners and past year sexual frequency. In Sample 3, those correlations were significant, but again, extraordinarily small. In Sample 4, these correlations were insignificant.

Correlations with other measures of out-of-control sexual behavior. As shown in Table 5, across samples, CSBD-DI scores were positively related to scores on other measures of out-of-control sexual behaviors and problematic pornography use, and these associations were large-to-very large (Funder & Ozer, 2019).

Correlations with psychological distress. As shown in Table 5, in Sample 1, the CSBD-DI demonstrated positive and small-to-medium (Funder & Ozer, 2019) associations with psychological distress and suicidality. In Samples 3 and 4, the CSBD-DI demonstrated positive and small (Funder & Ozer, 2019) associations with both depression and anxiety.

ROC analyses. In Sample 3, when using the CSBD-19 cutoff of 50 (Bőthe, Potenza, et al., 2020), ROC analyses revealed good classification accuracy for the CSBD-DI (AUC = 0.85; SE = 0.004, $P < 0.001$; 95% CI: 0.826, 0.879). In this sample, a cutoff of 1 corresponded to a sensitivity of 0.872 and a specificity of 0.721; and a cutoff of 2 corresponded to a sensitivity of 0.772 and a specificity of 0.851. In Sample 4, ROC analyses revealed good classification accuracy for the CSBD-DI (AUC = 0.894; SE = 0.076, $P < 0.001$; 95% CI: 0.744, 0.1.00). In this sample, a cutoff of 1 corresponded to a sensitivity of 0.875 and a specificity of 0.728, and a cutoff of 2 corresponded to a sensitivity of 0.875 and a specificity of 0.887.

STUDY 2

Method

Participants and procedure

Demographics are available in Table 1.

Sample 1. U.S adults were recruited online via YouGov Opinion Polling. In August of 2019, a panel of American adults ($N = 2,519$) were recruited and matched to U.S. representative norms for gender, age, race/ethnicity, census region, and income. A random subset ($N = 1,601$) completed all relevant measures.

Sample 2. Adults in Poland ($N = 1,036$) were recruited online via The Pollster Research Institute (https://pollster.pl/) in May 2019, representative for the Polish population with regards to gender, age, education, size of the place of residence, and region of residence (Lewczuk, Glica, Nowakowska, Gola, & Grubbs, 2020, 2021). Measures were translated using the same guidelines as used in Study 1, Samples 3 and 4.

Sample 3. Adults in Hungary ($N = 473$) were recruited online from a nationally representative sample of adult internet-users (matched for age, gender, income, and geographical region), recruited by a research market company (Solid Data ISA) in the spring of 2019. Measures were translated using the same guidelines as used in Study 1, Samples 3 and 4.

Measures

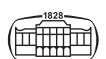*Sexual drive and related problems.* In Sample 1, we included a single item measure, developed for this study,

Table 3. Summary statistics for cross-validation measures across all 7 samples

	Sample 1 Malaysia (N = 375)		Sample 2 United States (N = 877)		Sample 3 Hungary (N = 7,279)		Sample 4 Germany (N = 449)		Sample 1 United States (N = 1,601)		Sample 2 Poland (N = 1,036)		Sample 3 Hungary (N = 473)	
	Mean (SD)	Int. Con	Mean (SD)	Int. Con	Mean (SD)	Int. Con	Mean (SD)	Int. Con	Mean (SD)	Int. Con	Mean (SD)	Int. Con	Mean (SD)	Int. Con
HBI-19	36.31 (15.16)	$\alpha = 0.95$ $\omega = 0.95$	–	–	13.89* (5.81)	$\alpha = 0.87$ $\omega = 0.87$	–	–	–	–	30.97 (13.66)	$\alpha = 0.96$ $\omega = 0.96$	–	–
CPUI-4	2.69 (1.44)	$\alpha = 0.86$ $\omega = 0.87$	–	–	–	–	–	–	2.24 (1.56)	$\alpha = 0.91$ $\omega = 0.91$	–	–	–	–
BPS	3.02 (2.66)	$\alpha = 0.83$ $\omega = 0.84$	–	–	–	–	–	–	1.81 (2.49)	$\alpha = 0.87$ $\omega = 0.87$	1.43 (2.24)	$\alpha = 0.88$ $\omega = 0.88$	–	–
CSBI-13	–	–	22.33 (9.07)	$\alpha = 0.93$ $\omega = 0.93$	–	–	–	–	–	–	–	–	–	–
CSBD-19	–	–	–	–	28.24 (9.07)	$\alpha = 0.91$ $\omega = 0.91$	26.98 (7.95)	$\alpha = 0.91$ $\omega = 0.91$	–	–	–	–	26.79 (9.62)	$\alpha = 0.94$ $\omega = 0.94$
PPCS-6	–	–	–	–	12.21 (7.01)	$\alpha = 0.86$ $\omega = 0.86$	10.27 (5.03)	$\alpha = 0.86$ $\omega = 0.86$	–	–	–	–	11.74 (7.26)	$\alpha = 0.88$ $\omega = 0.88$
BSI Depression	–	–	–	–	6.97 (5.96)	$\alpha = 0.87$ $\omega = 0.88$	11.06 (4.51)	$\alpha = 0.85$ $\omega = 0.85$	–	–	–	–	–	–
BSI Anxiety	–	–	–	–	6.69 (5.22)	$\alpha = 0.85$ $\omega = 0.85$	12.18 (4.05)	$\alpha = 0.80$ $\omega = 0.81$	–	–	–	–	–	–
PHQ-4	1.32 (0.77)	$\alpha = 0.84$ $\omega = 0.85$	–	–	–	–	–	–	1.84 (0.85)	$\alpha = 0.89$ $\omega = 0.89$	–	–	–	–
Suicidality	0.00¥ (0.81)	$\alpha = 0.83$ $\omega = 0.83$	–	–	–	–	–	–	0.00¥ (0.81)	$\alpha = 0.83$ $\omega = 0.84$	–	–	–	–

HBI-19 = Hypersexual Behavior Inventory; CPUI-4 = Cyber Pornography Use Inventory-4; BPS = Brief Pornography Screen; CSBI-13 = Compulsive Sexual Behavior Inventory 13; CSBD-19 = Compulsive Sexual Behavior Disorder Scale; PPCS-6 = Problematic Pornography Consumption Scale; BSI = Brief Symptom Inventory; PHQ-4 = Patient Health Questionnaire 4.

α = Cronbach's Alpha, ω = Omega total.

*In study 1, Sample 3, the HBI was modified to only include 8 items, thereby restricting the range to 8–40.

¥ = Suicidal behavior was measured using the Suicide Behavior Questionnaire Revised. To calculate a scale score, items were standardized and then an average was taken, resulting in a mean score of 0.

Table 4. Results of confirmatory factor analyses across all 7 samples

| | Study 1 | | | | | | | | Study 2 | | | | | |
| | Sample 1 Malaysia (N = 375) | | Sample 2 United States (N = 877) | | Sample 3 Hungary (N = 7,279) | | Sample 4 Germany (N = 449) | | Sample 1 United States (N = 1,601) | | Sample 2 Poland (N = 1,036) | | Sample 3 Hungary (N = 473) | |
	B	β	B	β	B	β	B	β	B	β	B	β	B	β
1[a]	1.00	0.56	1.00	0.56	1.00	0.65	1.00	0.57	1.00	0.62	1.00	0.66	1.00	0.70
2	1.03	0.51	0.74	0.49	0.96	0.61	1.17	0.60	0.71	0.47	0.92	0.65	1.01	0.62
3	0.59	0.39	1.07	0.54	0.78	0.54	0.92	0.47	0.90	0.64	0.75	0.56	0.61	0.55
4	0.79	0.52	1.46	0.64	0.94	0.60	1.07	0.59	0.89	0.61	0.81	0.60	0.87	0.69
5	0.99	0.54	1.13	0.61	1.17	0.67	1.32	0.70	0.97	0.65	1.02	0.66	1.17	0.77
6	0.45	0.48	1.10	0.67	0.93	0.71	1.03	0.67	0.85	0.66	0.94	0.72	1.06	0.75
7	1.02	0.48	1.01	0.51	0.97	0.60	0.78	0.39	0.89	0.54	0.93	0.51	1.15	0.72
Fit for 7-item version	χ^2 [14] = 13.899 $P = 0.457$ CFI = 0.964 TLI = 0.946 RMSEA = 0.038, SRMR = 0.057		χ^2 [14] = 41.60 $P < 0.001$ CFI = 0.957 TLI = 0.935 RMSEA = 0.060 SRMR = 0.075		χ^2 [14] = 87.46 $P < 0.001$ CFI = 0.987 TLI = 0.981 RMSEA = 0.029 SRMR = 0.041		χ^2 [14] = 8.43 $P = 0.866$ CFI = 0.979 TLI = 0.969 RMSEA = 0.025 SRMR = 0.057		χ^2 [14] = 130.63 $P < 0.001$ CFI = 0.992 TLI = 0.987 RMSEA = 0.035 SRMR = 0.041		χ^2 [14] = 15.64 $P = 0.336$ CFI = 0.978 TLI = 0.966 RMSEA = 0.029 SRMR = 0.063		χ^2 [14] = 7.04 $P = 0.933$ CFI = 0.988 TLI = 0.981 RMSEA = 0.025 SRMR = 0.064	
Internal Consistency	$\alpha = 0.70$ $\omega = 0.68$ Mean inter-item correlation = 0.25		$\alpha = 0.79$ $\omega = 0.79$ Mean inter-item correlation = 0.33		$\alpha = 0.82$ $\omega = 0.82$ Mean inter-item correlation = 0.39		$\alpha = 0.78$ $\omega = 0.78$ Mean inter-item correlation = 0.33		$\alpha = 0.80$ $\omega = 0.80$ Mean inter-item correlation = 0.36		$\alpha = 0.82$ $\omega = 0.82$ Mean inter-item correlation = 0.40		$\alpha = 0.87$ $\omega = 0.87$ Mean inter-item correlation = 0.48	

[a]For unstandardized estimates, Item 1 used as the index value for subsequent loadings. B = unstandardized estimate; β = standardized estimate

All analyses were conducted using Robust Diagonally Weighted Least Squares estimation with a mean-adjusted test statistic (i.e., the WLSM estimator in lavaan), as such, all CFI, TLI, and RMSEA values represent robust statistics

Table 5. Correlations between the compulsive sexual behavior disorder screen and validation measures

	Study 1				Study 2		
	Sample 1 Malaysia (N = 375)	Sample 2 U.S. (N = 877)	Sample 3 Hungary (N = 7,279)	Sample 4 Germany (N = 449)	Sample 1 U.S. (N = 1,601)	Sample 2 Poland (N = 1,036)	Sample 3 Hungary (N = 473)
Self-Reported Behaviors							
Past Year Sexual Frequency	0.21**	–	–	–	0.34**	–	–
Past Year Sexual Partners	–	0.21**	–	–	–	0.17**	–
Lifetime Sexual Partners	0.19**	–	0.04**	0.05	–	–	0.01
Past Year Casual Sexual Frequency	–	0.25**	0.07**	0.09	–	–	0.18**
Past Year Pornography Use	0.32**	0.29**	0.16**	0.18**	0.24**	0.19**	0.23**
Past Year Masturbation	0.29**	0.26**	0.16**	0.19**	0.24**	–	–
Cross-Validation Measures							
HBI	0.64**	–	0.40**	–	–	0.56**	–
CSBI-13	–	0.48**	–	–	–	–	–
CSBD-19	–	–	0.43**	0.51**	–	–	0.46**
BPS	0.46**	–	–	–	0.50**	0.37**	–
CPUI-4	0.46**	–	–	–	0.45**	–	–
PPCS-6	–	–	0.29**	0.50**	–	–	0.30**
Mental Health Measures							
BSI Depression	–	–	0.23**	0.23**	–	–	–
BSI Anxiety	–	–	0.21**	0.15**	–	–	–
PHQ-4	0.14**	–	–	–	0.31**	–	–
Suicidality	0.15**	–	–	–	0.37**	–	–

$^{*}P < 0.05$, $^{**}P < 0.01$.

All correlations reflect Holm-adjusted test statistics.

HBI = Hypersexual Behavior Inventory; CSBI-13 = Compulsive Sexual Behavior Inventory; CSBD-19 = Compulsive Sexual Behavior Disorder Scale 19; BPS = Brief Pornography Screen; CPUI-4 = Cyber Pornography Use Inventory-4; BSI = Brief Symptom Inventory; PHQ-4 = Patient Health Questionnaire – 4.

asking participants to categorize their sexual drive and potential problems associated with their sexual drive. Response options included: a) "I have a very high sex drive and/or high levels of sexual desire that often causes problems in my life," b) "I have a very high sex drive and/or high levels of sexual desire that typically does not cause problems in my life," c) "I believe my sex drive and/or levels of sexual desire are normal and typically do not cause problems in my life," d) "I believe my sex drive and/or levels of sexual desire are normal yet they often cause problems in my life," e) "I have a low sex drive or low levels of sexual desire that typically does not cause problems in my life," and f) "I have a low sex drive or low levels of sexual desire that often causes problems in my life." Endorsing the first item was taken as a categorical indicator of self-perceived problems with CSB.

Cross validation measures

Cross validation measures. In Sample 2, we included the HBI-19. In Sample 3, we included the CSBD-19.

Measures of problematic pornography use. In Sample 1, we included the BPS and CPUI-4. In Sample 2, we included the BPS. In Sample 3, we included the PPCS-6.

Self-reported behaviors. In Sample 1, we included measures of past year sexual frequency, past year pornography use, and past year masturbation on a scale of 1 (*never*) to 8 (*once a day or more*). In Sample 2, we included a

measure of frequency of pornography use on a scale of 0 (never in the lifetime) to 8 (*once a day or more*), as well as a measure of past-year number of sexual partners. In Sample 3, we included a measure of lifetime sexual partners and past year frequency (on a scale of 0 = *never* to 10 = *more than 7 times per week*) of casual sex and pornography use.

Mental health and psychological distress

In Sample 1, we included the previously described PHQ-4 and SBQ-R.

Analytic plan

Analyses followed the same sequence as described in Study 1, beginning with descriptive statistics and measures of internal consistency, continuing through confirmatory factor analysis, and then concluding with correlations with key measures. Additionally, given representative data across three languages, we conducted measurement invariance analyses by gender and language. Given the large sample size and corresponding biases in $\chi2$ values, we evaluated invariance by assessing changes in key fit indices (ΔCFI $\leq$ 0.010; ΔTLI $\leq$ 0.010; ΔRMSEA $\leq$ 0.015) where decreases in CFI/TLI or increases in RMSEA exceeding such thresholds on at least two indices were evidence of a failure to achieve invariance (Chen, 2007; Cheung & Rensvold, 2002). Specifically, we tested four levels of invariance: configural (equivalency of overall structure), metric (equivalency of

item loadings), scalar (equivalency of item intercepts), and residual (equivalency of item residuals) (Putnick & Bornstein, 2016). Correlations were calculated between the CSBD-DI and both behavioral self-report measures and other key measures using the same effect size interpretations as specified in Study 1. Finally, ROC analyses were conducted in Samples 1 and 3, to determine the sensitivity, specificity, and AUC of the CSBD-DI.

Ethics

To further confirm the utility of the CSBD-DI cross-culturally and establish norming data for the new measure, we collected data from cross-sectional, nationally representative panels in three countries. All data collections were approved by local institutional IRBs, and all participation was anonymous and voluntary.

Results

Samples varied slightly from each other, with the average age being much higher in the U.S. sample than in the Hungarian or Polish samples, though gender distributions were largely similar (see Table 1).

Confirmatory factor analyses

As shown in Table 4, confirmatory factor analyses revealed favorable results across all three samples regarding factor structure. In all samples, all items returned confirmatory factor loadings of 0.47 or greater, and internal consistency measures ranged from 0.80 to 0.87. Furthermore, analyses of invariance across languages revealed no significant changes in fit indices across all four levels of invariance testing thereby demonstrating residual (or strict) invariance by language. Analyses of invariance for gender demonstrated strong invariance (i.e., equivalence of model loadings, factor structure, and intercepts), though residual invariance was not achieved. Even so, mean comparisons by gender were appropriate given that scalar/strong invariance was demonstrated. Results of invariance testing are available in Table A4 in Appendix B.

Gender comparisons

In two samples, we found that men exhibited higher scores on the CSBD-DI than women, though these differences were quite small (Cohen's $d < 0.2$; See Table A3 in Appendix B). In our sample of Polish adults, we observed no significant differences between men and women (See Table A3 in Appendix B).

Correlations between behavioral self-report measures and CSBD-DI scores

Correlations between behavioral self-report measures and CSBD-DI scores ranged from positive-and-small correlations across the three countries to positive-and-large correlations (see Table 5).

Correlations with other measures of CSB

Overall, correlations between CSBD-DI scores and other measures of CSB (e.g., CSBD-19, BPS, PPCS-6) were generally positively correlated with each other across the three countries (see Table 5), and these associations were most often quite large (Funder & Ozer, 2019).

Correlations with general mental health measures

As shown in Table 5, among U.S. adults, CSBD-DI scores were positively correlated with psychological distress and suicidality, and these correlations were medium in size (Funder & Ozer, 2019).

ROC analyses

To determine the utility of the CSBD-DI in identifying individuals who identify as having problems due to high sexual drive or desire, we conducted a ROC analysis in Sample 1. Specifically, we sought to determine the accuracy of the CSBD-DI in identifying individuals who endorsed the following statement: "I have a very high sex drive and/or high levels of sexual desire that often causes problems in my life." Results indicated good classification accuracy (AUC = 0.86, SE = 0.029; 95% CI: 0.81, 0.92). A cutoff of 1 (20.2% of the sample) corresponded to a sensitivity of 0.84 and a specificity of 0.82; and a cutoff of 2 (11.7% of the sample) corresponded to a sensitivity of 0.77 and a specificity of 0.91.

In Sample 3, we tested the utility of the CSBD-DI in identifying those who scored above a cutoff on an established measure (i.e., the CSBD-19). ROC analyses of the CSBD-DI again revealed good classification accuracy (AUC = 0.80; SE = 0.063, $P < 0.001$; 95% CI: 0.67, 0.92). Furthermore, in in this sample, a cutoff of 1 (18.2% of the sample) corresponded to a sensitivity of 0.70 and a specificity of 0.85, whereas a cutoff of 2 (10.5% of the sample) corresponded to a sensitivity of 0.55 and a specificity of 0.91.

DISCUSSION

At the outset of this work, we aimed to develop and validate a novel, brief, and face-valid measure of CSBD symptoms that fully captured the criteria of the disorder. We collected data from seven samples, across five countries and four languages (Aggregate $N > 12{,}000$). Across all samples and settings, we found strong psychometric properties for the novel, 7-item CSBD-DI. Given the raised concerns about the exclusion of negative coping as a possible criterion of CSBD (Gola et al., 2022), we initially included two items in the scale that mirrored questions used in prior HD measures (Reid et al., 2011). However, the 7-item version of the scale, omitting the coping items, demonstrated superior fit across samples. The omitted items were frequently endorsed by participants, at rates that far exceeded what one might expect of a clinical symptom. Nevertheless, we recognize these two items may have clinical utility in treatment seeking populations while only having limited relevance in screening for CSBD more broadly in non-clinical samples (Bőthe et al., 2019).

We consistently found excellent robust fit indices for the 7-item scale that fully covers the criteria for CSBD, as well as evidence of internal consistency across samples. Combined with the achievement of strict/residual invariance across nationally representative samples in Poland, the U.S., and Hungary and strong/scalar invariance across gender, we take these findings to reflect a single, unidimensional scale that is broadly useful. Second, consistent with prior studies (Bőthe, Potenza, et al., 2020; Reid et al., 2012), across most samples, men, more so than women, reported higher symptoms associated with CSBD, though we did not observe such a gender difference in our nationally representative sample of Polish adults. The reason for this lack of difference among Polish adults is not yet clear. Further work is needed to compare CSBD-DI scores among men, women, and non-binary individuals seeking treatment for CSBD. Third, across the studies, we found medium-to-large correlations of the CSBD-DI with measures such as the HBI-19, CSBI-13, and CSBD-19. Similarly, we found medium-sized correlations between the CSBD-DI and the measures of problematic pornography use such as the CPUI-4, the BPS, and the PPCS-6, which we interpret as evidence of external validity (though we note that not all corresponding constructs were measured in all samples, which is a limitation). We also found much more modest correlations between CSBD-DI and pornography use frequency, masturbation frequency, casual sex frequency, lifetime sexual partners, and past year sexual frequency, which is consistent with prior work (Bőthe, Potenza, et al., 2020) and not particularly unexpected, as high frequency sexual behavior is not always problematic (Bőthe, Tóth-Király, Potenza, Orosz, & Demetrovics, 2020). Finally, we found small-to-medium correlations between the CSBD-DI and indicators of diminished mental health in the form of anxiety, depression, general distress, and suicidality. These findings are consistent with prior works noting that symptoms of CSBD are also associated with a range of psychiatric comorbidities including anxiety (Grant Weinandy et al., 2022), general emotional dysregulation (Lew-Starowicz et al., 2020), depression (Grubbs et al., 2022), and substance use disorders (Ballester-Arnal et al., 2020). Collectively, such findings suggest that individuals with greater symptoms of CSBD are indeed more profoundly distressed in other domains.

Across samples, item endorsement was generally low, which is expected from non-clinical samples, resulting in ROC analyses suggesting a cutoff of 1 or 2 be set for further diagnostic evaluation. More simply, endorsing one or more current symptoms of CSBD as captured by this measure likely suggests a need for further evaluation for CSBD with a clinical professional. The decision to use a cut-off score of 1 or greater on the CSBD-DI is supported by relatively strong accuracy classification which generally yielded reasonable sensitivity and specificity for the 7-item scale in identifying individuals who scored above cutoffs on the CSBD-19 (Study 1, Sample 3; Study 2, Sample 3) or who self-identified as having high levels of sexual desire or drive that often causes problems in their life (Study 2, Sample 1). Using the proposed cut-off score of 1 or higher on the CSBD-DI did

yield a large proportion of adults (∼20%) who screened at risk for CSBD, which is consistent with prior screening measures for problematic pornography use (Kraus et al., 2020), but is considerably higher than another recent study using the CSBD-19 (Bőthe, Potenza, et al., 2020). It is possible that a cutoff of 2 (approximately 10% of the national samples) may be more reasonable, though such a cutoff came at the expense of sensitivity in one sample (Study 2, Sample 3). Future research studies recruiting patients from clinical settings will be necessary to support a higher cut-off score. Specifically, there is a clear need for future studies that index the CSBD-DI against clinician-based diagnoses for evaluating efficacy in screening for CSBD.

A strength of the current study includes the variety of samples, comprised of university, community, and robust nationally representative samples across five countries. In turn, such sampling methods greatly increase the generalizability of results for the public. Even so, given the vast differences between samples and recruitment methods (e.g., undergraduate students, online workforce crowdsourcing, recruitment from adult websites, nationally representative samples), direct comparisons between samples should be made with caution. Further replication is needed to support our results, particularly among clinical populations. The majority of respondents for this study did not have out-of-control sexual behaviors, which is implied by the use of community and nationally representative samples. This highlights a need for studies of this topic among people with high-frequency or out-of-control sexual behaviors. Additionally, the present work did not differentiate different levels of severity or frequency for CSBD symptoms, instead only evaluating past-year presence. Future work using a more nuanced response scale might be valuable.

Six-of-seven samples were recruited from the U.S. or Europe, and our single sample collected in Malaysia was conducted among English speaking university students, which directly limits generalizability to non-Western countries (Grubbs et al., 2020). Further research with the CSBD-DI is needed to include more diverse populations (e.g., LGBTQ +, gender and ethnic/racially diverse individuals) and to better understand the etiology, prevalence, assessment, and best clinical practices for clients seeking help for CSBD (Griffin, Way, & Kraus, 2021). All samples were cross-sectional, as well, precluding evaluation of temporal stability or test-retest reliability and illustrating a need for longitudinal evaluations of this measure.

Additional limitations for the current measure include the development of the inventory via expert consensus rather than item-bank reduction or exploratory factor analyses. Even so, the psychometric properties of the instrument, particularly the multi-language measurement invariance in Study 2, demonstrate the unitary nature of the inventory and its utility in numerous settings. Finally, we note that this measure was only tested alongside measures of self-reported sexual behavior or alongside of measures of problematic sexual behavior. Future work should examine this measure in conjunction with measures of personality, other forms of psychopathology, and other dimensions of

sexual functioning such as sexual inhibition/excitation or erotophobia/erotophilia.

CONCLUSIONS

The inclusion of CSBD as a novel diagnosis in the eleventh edition of the ICD has presented a clear and pressing need for better assessments of the disorder, particularly in the form of brief measures with some diagnostic utility. Across 12,000 participants, 5 countries, and 4 languages, the 7-item CSBD-DI demonstrated strong psychometric qualities and converging evidence of validity in the form of associations with existing measures of out-of-control sexual behaviors, problematic pornography use, and self-reported sexual behaviors. Additionally, the CSBD-DI demonstrated positive associations with depression, anxiety, and suicidality. Collectively, given that the 7 items of the CSBD-DI fully cover the essential criteria for CSBD, our results suggest that the CSBD-DI is a useful screening measure for CSBD, with initial evidence of cross-cultural validity.

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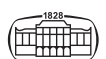
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Appendix A: CSBD-DI with additional coping items

Appendix: CSBD-DI with Additional Coping Items

Instructions: Below are statements that describe various thoughts, feelings, and behaviors. As you answer each question, select a response that best describes what is true for you. Only select <u>one</u> response for each statement and please be sure to answer every question. For this questionnaire, sex is defined as any activity or behavior that stimulates or arouses a person with the intent to produce an orgasm or sexual pleasure. (e.g., self-masturbation or solo-sex, using pornography, intercourse with a partner, oral sex, anal sex, etc…) <u>*Sexual behaviors may or may not involve a partner*</u>.

1. I have spent too much time focused on sexual fantasies, sexual urges, <u>*and*</u> sexual behaviors to the extent I neglect responsibilities (e.g. work, education, etc…), my health, or personal relationships.

   ❑ This has been true for at least 6 months during the last 12 months   ❑ This has been true in my lifetime but not during the last 12 months   ❑ This has never been true of me.

2. I have made numerous unsuccessful attempts to stop, reduce or control the frequency of my sexual fantasies, urges, <u>*and*</u> behaviors?

   ❑ This has been true for at least 6 months during the last 12 months   ❑ This has been true in my lifetime but not during the last 12 months   ❑ This has never been true of me.

3. I often engage in sexual behavior despite the risk of *physical harm* (e.g. sexually transmitted infection, unintended pregnancy, injury, or illness, etc…).

   ❑ This has been true for at least 6 months during the last 12 months   ❑ This has been true in my lifetime but not during the last 12 months   ❑ This has never been true of me.

4. I often engage in sexual behavior despite the risk of *emotional harm* to myself or others (such as hurting the feelings of a romantic partner, a family member, or close friends).

   ❑ This has been true for at least 6 months during the last 12 months   ❑ This has been true in my lifetime but not during the last 12 months   ❑ This has never been true of me.

5. My sexual fantasies, urges, and behavior have often *caused* significant personal distress in my life (such as feelings of sadness, depression, shame, guilt, regret, worry, hopelessness, etc…).

   ❑ This has been true for at least 6 months during the last 12 months   ❑ This has been true in my lifetime but not during the last 12 months   ❑ This has never been true of me.

6. My sexual fantasies, urges, and behavior have often caused significant *problems or consequences* in my personal relationships with others, in social situations, my work, or other important aspects of my life (e.g. education, goal achieving, etc.).

   ❑ This has been true for at least 6 months during the last 12 months   ❑ This has been true in my lifetime but not during the last 12 months   ❑ This has never been true of me.

7. I repeatedly engage in sexual behavior even when it gives me little or no pleasure or satisfaction.

   ❑ This has been true for at least 6 months during the last 12 months   ❑ This has been true in my lifetime but not during the last 12 months   ❑ This has never been true of me.

8. I have often used sexual fantasies, urges, and behaviors to escape or distract myself from *unpleasant feelings* such as depression, sadness, loneliness, anxiety, boredom, restlessness, shame, irritability, anger, etc…

   ❑ This has been true for at least 6 months during the last 12 months   ❑ This has been true in my lifetime but not during the last 12 months   ❑ This has never been true of me.

9. I have often used sexual fantasies, urges, and behaviors to avoid or cope with *stressful experiences* in my life.

   ❑ This has been true for at least 6 months during the last 12 months   ❑ This has been true in my lifetime but not during the last 12 months   ❑ This has never been true of me.

SCORING NOTE: Items 8 and 9 are not counted in total.
Endorsement of at least one current symptom on items 1-7 is suggestive of a need for further clinical evaluation.

(continued)

Continued

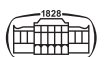| **CSBD-DI with Additional Coping Items (German version)** |
|---|
| Unten finden Sie Aussagen, die verschiedene Gedanken, Gefühle und Verhaltensweisen beschreiben. Wählen Sie bei jeder Frage diejenige Antwort, die am besten beschreibt, was auf Sie zutrifft. Wählen Sie nur eine Antwort für jede Aussage und stellen Sie bitte sicher, dass Sie jede Frage beantworten. Für diesen Fragebogen ist Sex definiert als jede Aktivität oder jedes Verhalten, das eine Person stimuliert oder erregt, mit dem Ziel, einen Orgasmus oder sexuelles Vergnügen hervorzurufen (z.B. Selbstbefriedigung oder Solo-Sex, Konsum von Pornografie, Geschlechtsverkehr mit Partnerin oder Partner, Oralverkehr, Analverkehr etc…). *Sexuelle Verhaltensweisen können mit oder ohne Partnerin/Partner stattfinden.* |
| 1. Ich habe zu viel Zeit damit verbracht, mich auf sexuelle Fantasien, sexuelles Verlangen _und_ sexuelle Verhaltensweisen zu fokussieren und zwar in einem Ausmaß, das mich meine Verpflichtungen, meine Arbeit, meine Gesundheit oder meine persönlichen Beziehungen vernachlässigen lässt.

❑ Traf in mindestens 6 Monaten der vergangenen 12 Monate auf mich zu   ❑ Traf in meinem Leben schon zu, aber nicht in den vergangenen 12 Monaten   ❑ Traf noch nie auf mich zu |
| 2. Ich habe häufig erfolglos versucht, das Ausmaß meines sexuellen Verlangens und meiner sexuellen Fantasien _und_ Verhaltensweisen zu reduzieren oder zu kontrollieren.

❑ Traf in mindestens 6 Monaten der vergangenen 12 Monate auf mich zu   ❑ Traf in meinem Leben schon zu, aber nicht in den vergangenen 12 Monaten   ❑ Traf noch nie auf mich zu |
| 3. Ich habe mich häufig trotz *körperlicher Gefährdung* (z.B. sexuell übertragbare Infektion, ungewollte Schwangerschaft, Verletzung oder Krankheit etc…) auf sexuelle Verhaltensweisen eingelassen.

❑ Traf in mindestens 6 Monaten der vergangenen 12 Monate auf mich zu   ❑ Traf in meinem Leben schon zu, aber nicht in den vergangenen 12 Monaten   ❑ Traf noch nie auf mich zu |
| 4. Ich habe mich häufig trotz *emotionalen Leidens* meiner selbst oder anderer (wie etwa die Gefühle einer Partnerin/eines Partners, eines Familienmitglieds oder einer engen Freundin/eines engen Freundes zu verletzen) oft sexuellen Verhaltensweisen hingegeben.

❑ Traf in mindestens 6 Monaten der vergangenen 12 Monate auf mich zu   ❑ Traf in meinem Leben schon zu, aber nicht in den vergangenen 12 Monaten   ❑ Traf noch nie auf mich zu |
| 5. Mein sexuelles Verlangen sowie sexuellen Fantasien und Verhaltensweisen haben häufig bedeutendes persönliches Leid in meinem Leben *verursacht* (wie beispielsweise Gefühle von Traurigkeit, Depression, Scham, Schuld, Reue, Sorge, Hoffnungslosigkeit etc…).

❑ Traf in mindestens 6 Monaten der vergangenen 12 Monate auf mich zu   ❑ Traf in meinem Leben schon zu, aber nicht in den vergangenen 12 Monaten   ❑ Traf noch nie auf mich zu |
| 6. Mein sexuelles Verlangen sowie sexuellen Fantasien und Verhaltensweisen haben häufig bedeutsame *Probleme oder Konsequenzen* in meinen persönlichen Beziehungen mit anderen, sozialen Situationen, meiner Arbeit oder anderen wichtigen Aspekten meines Lebens verursacht.

❑ Traf in mindestens 6 Monaten der vergangenen 12 Monate auf mich zu   ❑ Traf in meinem Leben schon zu, aber nicht in den vergangenen 12 Monaten   ❑ Traf noch nie auf mich zu |
| 7. Ich habe mich wiederholt auf sexuelle Verhaltensweisen eingelassen, auch wenn es mir wenig oder gar kein Vergnügen oder Befriedigung bereitet hat.

❑ Traf in mindestens 6 Monaten der vergangenen 12 Monate auf mich zu   ❑ Traf in meinem Leben schon zu, aber nicht in den vergangenen 12 Monaten   ❑ Traf noch nie auf mich zu |
| 8. Ich habe häufig sexuelles Verlangen, sexuelle Fantasien und Verhaltensweisen benutzt, um mich von *unangenehmen Gefühlen* wie beispielsweise Depression, Traurigkeit, Einsamkeit, Ängstlichkeit, Langeweile, Unruhe, Scham, Reizbarkeit etc. abzulenken oder ihnen zu entkommen.

❑ Traf in mindestens 6 Monaten der vergangenen 12 Monate auf mich zu   ❑ Traf in meinem Leben schon zu, aber nicht in den vergangenen 12 Monaten   ❑ Traf noch nie auf mich zu |
| 9. Ich habe häufig sexuelles Verlangen, sexuelle Fantasien und Verhaltensweisen dazu benutzt um *stressvolle Erfahrungen* in meinem Leben zu vermeiden oder damit umzugehen.

❑ Traf in mindestens 6 Monaten der vergangenen 12 Monate auf mich zu   ❑ Traf in meinem Leben schon zu, aber nicht in den vergangenen 12 Monaten   ❑ Traf noch nie auf mich zu |
| SCORING HINWEIS: Items 8 und 9 werden nicht in den Total score eingeschlossen.
Die Bejahung mindestens eines aktuellen Symptoms auf den Items 1-7 deutet auf die Notwendigkeit einer weiteren klinischen Bewertung hin. |

Continued

CSBD-DI with Additional Coping Items (Polish version)

Instrukcje: Poniżej znajdują się stwierdzenia opisujące różne myśli, uczucia i zachowania. Ustosunkuj się do każdego z nich, zaznaczając odpowiedź, która najbardziej odpowiada temu, co jest dla Ciebie prawdziwe. Zawsze zaznacz tylko <u>jedną</u> odpowiedź i upewnij się, że nie pominąłeś/aś żadnego ze stwierdzeń. Na potrzeby tego kwestionariusza seks definiowany jest jako każde działanie, które zwiększa Twoje pobudzenie i ma na celu osiągnięcie orgazmu lub przyjemności seksualnej (np. masturbacja, korzystanie z pornografii, stosunek z partnerem lub partnerką, seks oralny, analny itp.). *Zachowania seksualne mogą, ale nie muszą wiązać się z zaangażowaniem partnera lub partnerki.*

1. Poświęcałem/am za dużo czasu fantazjom, myślom <u>oraz</u> zachowaniom seksualnym do tego stopnia, że wiązało się to z zaniedbywaniem przeze mnie obowiązków (np. związanych z pracą, edukacją lub domem), zdrowia oraz relacji z innymi ludźmi.

    ❏ To stwierdzenie było prawdziwe w odniesieniu do mojego życia przez co najmniej 6 z ostatnich 12 miesięcy.   ❏ To stwierdzenie było prawdziwe w odniesieniu do mojego życia, ale nie w ciągu ostatnich 12 miesięcy.   ❏ To stwierdzenie nigdy mnie nie dotyczyło.

2. Podejmowałem/am wiele nieudanych prób zaprzestania, ograniczenia lub kontrolowania częstotliwości moich fantazji, myśli <u>oraz</u> zachowań seksualnych.

    ❏ To stwierdzenie było prawdziwe w odniesieniu do mojego życia przez co najmniej 6 z ostatnich 12 miesięcy.   ❏ To stwierdzenie było prawdziwe w odniesieniu do mojego życia, ale nie w ciągu ostatnich 12 miesięcy.   ❏ To stwierdzenie nigdy mnie nie dotyczyło.

3. Często podejmuję zachowania seksualne pomimo ryzyka *szkody dla zdrowia fizycznego* (np. choroby przenoszone drogą płciową, nieplanowana ciąża, urazy bądź inne choroby itd.).
    ❏ To stwierdzenie było prawdziwe w odniesieniu do mojego życia przez co najmniej 6 z ostatnich 12 miesięcy.   ❏ To stwierdzenie było prawdziwe w odniesieniu do mojego życia, ale nie w ciągu ostatnich 12 miesięcy.   ❏ To stwierdzenie nigdy mnie nie dotyczyło.

4. Często podejmuję zachowania seksualne pomimo ryzyka *szkody emocjonalnej* dla mnie lub innych osób (np. zranienie uczuć partnera/ki, członka rodziny lub bliskich przyjaciół).
    ❏ To stwierdzenie było prawdziwe w odniesieniu do mojego życia przez co najmniej 6 z ostatnich 12 miesięcy.   ❏ To stwierdzenie było prawdziwe w odniesieniu do mojego życia, ale nie w ciągu ostatnich 12 miesięcy.   ❏ To stwierdzenie nigdy mnie nie dotyczyło.

5. Moje seksualne fantazje, myśli i zachowania często *wywoływały* silny dyskomfort w moim życiu (np. uczucia smutku, depresji, wstydu, poczucia winy, żalu, zmartwienia, bezradności itd.).
    ❏ To stwierdzenie było prawdziwe w odniesieniu do mojego życia przez co najmniej 6 z ostatnich 12 miesięcy.   ❏ To stwierdzenie było prawdziwe w odniesieniu do mojego życia, ale nie w ciągu ostatnich 12 miesięcy.   ❏ To stwierdzenie nigdy mnie nie dotyczyło.

6. Moje seksualne fantazje, myśli i zachowania często powodowały istotne *problemy lub miały negatywne konsekwencje* dla moich relacji z innymi ludźmi, w sytuacjach społecznych, w pracy, bądź w innych aspektach mojego życia (np. edukacja, osiąganie założonych celów itd.).

    ❏ To stwierdzenie było prawdziwe w odniesieniu do mojego życia przez co najmniej 6 z ostatnich 12 miesięcy.   ❏ To stwierdzenie było prawdziwe w odniesieniu do mojego życia, ale nie w ciągu ostatnich 12 miesięcy.   ❏ To stwierdzenie nigdy mnie nie dotyczyło.

7. Wielokrotnie podejmowałem/am zachowania seksualne nawet wtedy, gdy dawały mi one niewiele lub nie dawały w ogóle przyjemności czy satysfakcji.
    ❏ To stwierdzenie było prawdziwe w odniesieniu do mojego życia przez co najmniej 6 z ostatnich 12 miesięcy.   ❏ To stwierdzenie było prawdziwe w odniesieniu do mojego życia, ale nie w ciągu ostatnich 12 miesięcy.   ❏ To stwierdzenie nigdy mnie nie dotyczyło.

8. Często korzystałem/am z fantazji, myśli i zachowań seksualnych jako sposobu aby odwrócić uwagę bądź uciec od *nieprzyjemnych uczuć*, takich jak depresja, smutek, samotność, lęk, znudzenie, niepokój, wstyd, rozdrażnienie, gniew itd.
    ❏ To stwierdzenie było prawdziwe w odniesieniu do mojego życia przez co najmniej 6 z ostatnich 12 miesięcy.   ❏ To stwierdzenie było prawdziwe w odniesieniu do mojego życia, ale nie w ciągu ostatnich 12 miesięcy.   ❏ To stwierdzenie nigdy mnie nie dotyczyło.

9. Często korzystałem/am z fantazji, myśli i zachowań seksualnych, aby uniknąć lub poradzić sobie ze *stresującymi doświadczeniami* w moim życiu.

    ❏ To stwierdzenie było prawdziwe w odniesieniu do mojego życia przez co najmniej 6 z ostatnich 12 miesięcy.   ❏ To stwierdzenie było prawdziwe w odniesieniu do mojego życia, ale nie w ciągu ostatnich 12 miesięcy.   ❏ To stwierdzenie nigdy mnie nie dotyczyło.

    OBLICZANIE WYNIKÓW: Pozycje 8 i 9 nie powinny być brane pod uwagę przy obliczaniu wyniku ogólnego. Poparcie obecnego występowania co najmniej jednego kryterium ocenianego przez pozycje 1-7, sugeruje potrzebę dalszej ewaluacji klinicznej.

Continued

CSBD-DI with Additional Coping Items (Hungarian version)	
Instrukciók: Az alábbi állítások különböző gondolatokat, érzéseket és viselkedéseket írnak le. A kérdésekre válaszolva azt a lehetőséget válaszd ki, amelyik a leginkább igaz rád! Csak <u>egy</u> választ jelölj be mindegyik állításnál és győződj meg róla, hogy biztosan válaszoltál mindegyik kérdésre! A kérdőív szexnek tekint minden olyan cselekvést vagy viselkedést, amely stimulál vagy felizgat valakit és célja szexuális gyönyör vagy orgazmus elérése (pl. önkielégítés, pornográfia nézése, partnerrel való szexuális együttlét bármely formája, közösülés, orális szex, anális szex stb.). <u>*Ne feledd tehát, hogy szexuális viselkedés egyaránt létrejöhet egyedül és partnerrel!*</u>	
1.	Olyan sok időt töltöttem szexuális fantáziákkal, vágyakkal *és* viselkedésekkel, hogy elhanyagoltam a kötelezettségeimet, a munkámat, az egészségemet vagy a személyes kapcsolataimat. ❑ Az elmúlt 12 hónapban legalább 6 hónapon keresztül igaz volt rám. ❑ Igaz volt rám valamikor az életem során, de az elmúlt 12 hónapban nem. ❑ Soha nem volt rám igaz.
2.	Számos sikertelen kísérletet tettem a szexuális fantáziáim, vágyaim *és* viselkedésem gyakoriságának csökkentésére vagy szabályozására. ❑ Az elmúlt 12 hónapban legalább 6 hónapon keresztül igaz volt rám. ❑ Igaz volt rám valamikor az életem során, de az elmúlt 12 hónapban nem. ❑ Soha nem volt rám igaz.
3.	Gyakran *fizikai ártalmakat* (pl. nemi úton terjedő fertőzések, nem kívánt terhesség, betegségek, sérülések stb.) kockáztatva vettem részt szexuális viselkedésekben. ❑ Az elmúlt 12 hónapban legalább 6 hónapon keresztül igaz volt rám. ❑ Igaz volt rám valamikor az életem során, de az elmúlt 12 hónapban nem. ❑ Soha nem volt rám igaz.
4.	Gyakran a magam vagy mások *érzelmi sérülését* (pl. partner, családtag, vagy közeli barátok érzéseinek megbántása) kockáztatva vettem részt szexuális viselkedésekben. ❑ Az elmúlt 12 hónapban legalább 6 hónapon keresztül igaz volt rám. ❑ Igaz volt rám valamikor az életem során, de az elmúlt 12 hónapban nem. ❑ Soha nem volt rám igaz.
5.	A szexuális fantáziáim, vágyaim és viselkedésem gyakran *okoztak* jelentős érzelmi nehézségeket az életemben (pl. szomorúság, depresszió, szégyen, bűntudat, megbánás, aggodalom, reménytelenség stb.). ❑ Az elmúlt 12 hónapban legalább 6 hónapon keresztül igaz volt rám. ❑ Igaz volt rám valamikor az életem során, de az elmúlt 12 hónapban nem. ❑ Soha nem volt rám igaz.
6.	A szexuális fantáziáim, vágyaim és viselkedésem gyakran okoztak jelentős *problémákat vagy negatív következményeket* a másokkal való személyes kapcsolataimban, társas helyzetekben, a munkámban vagy az életem más fontos területein. ❑ Az elmúlt 12 hónapban legalább 6 hónapon keresztül igaz volt rám. ❑ Igaz volt rám valamikor az életem során, de az elmúlt 12 hónapban nem. ❑ Soha nem volt rám igaz.
7.	Újra és újra részt vettem szexuális viselkedésekben még akkor is, ha azok nem vagy csak kis mértékben okoztak számomra élvezetet vagy kielégülést. ❑ Az elmúlt 12 hónapban legalább 6 hónapon keresztül igaz volt rám. ❑ Igaz volt rám valamikor az életem során, de az elmúlt 12 hónapban nem. ❑ Soha nem volt rám igaz.
8.	Gyakran használtam szexuális fantáziákat, vágyakat és viselkedéseket arra, hogy elmeneküljek vagy elvonjam a figyelmem a *kellemetlen érzésekről*, mint amilyen például a rossz hangulat, bánat, szomorúság, magány, szorongás, unalom, nyugtalanság, szégyen, ingerlékenység stb. ❑ Az elmúlt 12 hónapban legalább 6 hónapon keresztül igaz volt rám. ❑ Igaz volt rám valamikor az életem során, de az elmúlt 12 hónapban nem. ❑ Soha nem volt rám igaz.
9.	Gyakran használtam szexuális fantáziákat, vágyakat és viselkedéseket arra, hogy elkerüljem vagy megküzdjek az életemben előforduló *stresszes élményekkel*. ❑ Az elmúlt 12 hónapban legalább 6 hónapon keresztül igaz volt rám. ❑ Igaz volt rám valamikor az életem során, de az elmúlt 12 hónapban nem. ❑ Soha nem volt rám igaz.
KIÉRTÉKELÉS: A 8. és 9. tétel nem számolandó bele az összpontszámba. Az 1-7. tételek közül legalább egy tünet jelenlegi megléte arra utal, hogy további klinikai vizsgálatra van szükség.	

Appendix B: Supplemental tables

Table A1. Comparison of DSM-5 criteria for hypersexual disorder and icd-11 criteria for compulsive sexual behavior disorder

DSM-5 Proposed Criteria for Hypersexual Disorder	ICD-11 Criteria for Compulsive Sexual Behavior Disorder
A. Over a period of at least six months, recurrent and intense sexual fantasies, sexual urges, and sexual behavior in association with four or more of the following five criteria: 1. Excessive time is consumed by sexual fantasies and urges, and by planning for and engaging in sexual behavior. 2. *Repetitively engaging in these sexual fantasies, urges, and behavior in response to dysphoric mood states (e.g., anxiety, depression, boredom, irritability).* 3. *Repetitively engaging in sexual fantasies, urges, and behavior in response to stressful life events.* 4. Repetitive but unsuccessful efforts to control or significantly reduce these sexual fantasies, urges, and behavior. 5. Repetitively engaging in sexual behavior while disregarding the risk for physical or emotional harm to self or others. B. There is clinically significant personal distress or impairment in social, occupational, or other important areas of functioning associated with the frequency and intensity of these sexual fantasies, urges, and behavior. C. These sexual fantasies, urges, and behavior are not due to direct physiological effects of exogenous substances (e.g., drugs of abuse or medications), a co-occurring general medical condition, or to Manic Episodes. D. The person is at least 18 years of age	Compulsive sexual behavior disorder is characterized by a persistent pattern of failure to control intense, repetitive sexual impulses or urges resulting in repetitive sexual behavior. Symptoms may include: • Repetitive sexual activities becoming a central focus of the person's life to the point of neglecting health and personal care or other interests, activities and responsibilities; • Numerous unsuccessful efforts to significantly reduce repetitive sexual behavior; • *Continued repetitive sexual behavior despite adverse consequences or deriving little or no satisfaction from it.* • The pattern of failure to control intense, sexual impulses or urges and resulting repetitive sexual behavior is manifested over an extended period of time (e.g., 6 months or more), and • Causes marked distress or significant impairment in personal, family, social, educational, occupational, or other important areas of functioning. *Distress that is entirely related to moral judgments and disapproval about sexual impulses, urges, or behaviors is not sufficient to meet this requirement.*

Hypersexual Disorder criteria adapted from: Kafka, 2010, 2014; Reid et al., 2012.
ICD-11 CSBD criteria adapted from: Kraus et al., 2018; World Health Organization, 2019.
Criteria in *italics* represent criteria unique to respective diagnosis.
The final seven CSBD-DI items correspond only to the CSBD criteria, as two coping items were omitted, but cover the CSBD criteria comprehensively. With the inclusion of the two omitted coping items (See Appendix A), the CSBD-DI fully encompasses criteria for both HD and CSBD.
The Hypersexual Behavior Inventory-19 (Reid et al., 2011) fully covers the criteria for HD but does not include any assessment of perseveration in sexual behavior despite little or no satisfaction.
The Compulsive Sexual Behavior Disorder Scale (Bőthe, Potenza, et al., 2020) fully covers the criteria for CSBD but did not include items assessing use of sexual behavior to cope with dysphoric mood states.
The Compulsive Sexual Behavior Inventory-13(Coleman, Miner, Ohlerking, & Raymond, 2001; Miner et al., 2017) does not directly assess the criteria for either disorder (though scores correspond with scores on the HBI-19 and CSBD-DI).

Table A2. Comparison of fit indices for full 9-item version and modified 7-item version of the CSBD-Screen

	Sample 1 (N = 375)	Sample 2 (N = 879)	Sample 3 (N = 7,279)	Sample 4 (N = 449)
Fit for 9-item version	χ^2 [27] = 47.20, P = 0.009, Robust CFI = 0.951; TLI = 0.934; RMSEA = 0.059; SRMR = 0.078	χ^2 [27] = 109.88, P < 0.001, Robust CFI = 0.933; Robust TLI = 0.911; Robust RMSEA = 0.079; SRMR = 0.087	χ^2 [27] = 866.83, P < 0.001, Robust CFI = 0.943; Robust TLI = 0.923; Robust RMSEA = 0.066; SRMR = 0.041	χ^2 [27] = 32.145, P = 0.227, Robust CFI = 0.951; Robust TLI = 0.937; Robust RMSEA = 0.044; SRMR = 0.076
Fit for 7-item version	χ^2 [26] = 21.14, P = 0.734; CFI = 0.986, TLI = 0.981, RMSEA = 0.032, SRMR = 0.056	χ^2 [26] = 42.99, P = 0.019, Robust CFI = 0.978; Robust TLI = 0.970; Robust RMSEA = 0.046; SRMR = 0.062	χ^2 [26] = 131.64, P < 0.001; CFI = 0.992, TLI = 0.989, RMSEA = 0.026, SRMR = 0.038	χ^2 [26] = 12.91, P = 0.985; CFI = 0.991, TLI = 0.987, RMSEA = 0.020, SRMR = 0.052
	$\Delta\chi^2$ [1] = 20.66, P < 0.001	$\Delta\chi^2$ [1] = 84.05, P < 0.001	$\Delta\chi^2$ [1] = 1010.5, P < 0.001	$\Delta\chi^2$ [1] = 34.14, P < 0.001

All analyses were conducted using Robust Diagonally Weighted Least Squares estimation with a mean-adjusted test statistic (i.e., the WLSM estimator in lavaan), as such, all CFI, TLI, and RMSEA values represent robust statistics.

For the seven-item version, in order to compare nested models, items 8 and 9 (the coping items) were omitted from the latent variable but included as observed covariates.

Table A3. Comparison of men and women's mean scores on the compulsive sexual behavior disorder-diagnostic inventory

Sample	Men's Mean (SD)	Women's Mean (SD)	t	df	P	Cohen's d
Study 1						
Sample 1 (Malaysia)	1.36 (1.75)	0.075 (1.17)	3.87	375	<0.001	0.46
Sample 2 (U.S.)	1.69 (2.07)	1.73 (2.12)	0.28	875	0.778	0.02
Sample 3 (Hungary)	0.81 (1.55)	0.55 (2.88)	7.47	7,254	<0.001	0.18
Sample 4 (Germany)	0.67 (1.37)	0.37 (0.99)	2.56	306	0.011	0.26
Study 2						
Sample 1 (U.S.)	0.057 (1.29)	0.40 (1.07)	3.01	1,610	0.003	0.15
Sample 2 (Poland)	0.49 (1.23)	0.40 (1.10)	1.22	1,034	0.223	0.08
Sample 3 (Hungary)	0.59 (1.42)	0.35 (1.15)	1.96	471	0.050	0.18

Table A4. Results of measurement invariance testing across national samples on the basis of country/language of administration and gender

	Country/Language					
	TLI	CFI	RMSEA	Robust CFI	Robust TLI	Robust RMSEA
Configural	1.012	1.000	0.000	0.990	0.984	0.020
Metric	0.999*	0.999	0.004	0.978*	0.979	0.023
Scalar	1.001	1.000	0.000	0.983	0.980	0.023
Residual	0.997	0.997	0.008	0.972*	0.978	0.024
	Gender					
	TLI	CFI	RMSEA	Robust CFI	Robust TLI	Robust RMSEA
Configural	1.007	1.000	0.000	0.993	0.99	0.016
Metric	0.998	0.998	0.008	0.987	0.984	0.02
Scalar	0.987*	0.988	0.018	0.975*	0.974	0.026
Residual	0.974*	0.971*	0.026	0.957*	0.961*	0.032

TLI = Tucker Lewis Index; CFI = Comparative Fit Index; RMSEA = Root Mean Square Error of Approximation.

*significant difference observed: ΔCFI ≤ 0.010; ΔTLI ≤ 0.010; ΔRMSEA ≤ 0.015.

Robust values the result of using diagonally weighted least squares estimation with a mean adjusted test statistic via the WLSM operator in *lavaan*.

Significant differences between steps were based on the presence of at least two of the following changes in either fit indices or Robust Fit Indices (i.e., 2/3 showing significant change in either raw fit indices or robust fit indices). Such Differences were only observed for Gender between Step 3 (scalar) and 4 (residual) invariance. Subsequent investigation revealed differences in residual variance by gender for items 1, 2, and 9.