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A Review of Behavioral Interventions for Compulsive Sexual Behavior Disorder

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Abstract

Purpose of Review Compulsive sexual behavior disorder (CSBD) is a new diagnosis included in the *International Classification of Diseases 11th Revision* (ICD-11). Interventions have been developed to address CSBD-related issues. We sought to review findings from recently published behavioral interventions for CSBD.

Recent Findings Nine clinical trials met criteria for inclusion in our review. Each intervention was associated with decreases in CSBD symptoms. Intervention formats differed considerably. Acceptance and commitment therapy and cognitive behavioral therapy were the most common overarching conceptual approaches. Most of the studies utilized small samples. Trials with larger samples had significant attrition problems. Of the reviewed studies, no follow-up measurements beyond 6-month post-treatment occurred. Almost all of the samples were comprised of men from Western countries. Four of the nine trials had control conditions (a waitlist in each case).

Summary While behavioral interventions for CSBD will likely decrease symptoms, future research is needed to ascertain preferred approaches. To address current treatment gaps in the literature, we recommend additional clinical trials utilizing larger/diverse samples with stronger conceptual grounding.

Keywords Compulsive sexual behavior disorder · Problematic pornography use, Hypersexual disorder · Behavioral interventions · Review

Introduction

Compulsive sexual behavior disorder (CSBD) is a new diagnostic construct relevant to addiction researchers, clinicians, and educators. The recently released ICD-11 defines CSBD as *a persistent pattern of failure to control intense, repetitive sexual impulses or urges resulting in repetitive sexual behavior that causes marked distress or impairment in personal, family, social, educational, occupational, or other important areas of functioning* [1•]. While this formal definition has only recently been adopted, it is based on many years of research and refined conceptualization [2••, 3].

Historically, researchers and clinicians have adopted various names and definitions to address issues consistent with CSBD; such examples include hypersexuality/hypersexual disorder [4–6], sexual impulsivity [7, 8], compulsive sexuality [7, 9], and sexual addiction [10, 11]. The historical absence of a formal definition has led to confusion among researchers and the general public and has likely hindered research advancements [12, 13]. With the formalization of a diagnostic label/criteria, it is hoped the researchers and clinicians will be able to better measure, predict, prevent, and treat CSBD [14].

While the ICD-11 currently classifies CSBD as impulse control disorder, there is ongoing debate regarding whether CSBD should be classified as an impulse control disorder, compulsive disorder (such as in obsessive–compulsive disorder), or an addiction [15••]. It is also possible that future classification may involve a non-syndromal/dimensional approaches, such as those espoused by the Research Domain Criteria (RDoC; [16]) and Hierarchical Taxonomy of Psychopathology (HiTOP; [17]). Regardless of its classification, there is strong evidence that members of the public consider

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CSB's to be behavioral addictions [14, 15••] and as such use pathological language (such as addiction) regardless of whether the behavior is consistent with diagnostic criteria [18, 19]. While lay persons are technically inaccurate when using such language (e.g., sex addict, porn addict), the phenomenon highlights the psychological distress often associated with CSB's.

Given the functional impairment associated with CSBD [2••], high comorbidity of CSBD with other psychopathologies (e.g., substance use and affective disorders) [13, 20], and the psychological distress often associated with CSBD-consistent constructs (such as problematic pornography use) [21–23], there is a need for evaluating the effectiveness of evidence-based treatments. This is an active area of research, with behavioral and pharmacological interventions being considered [14, 24••, 25]. The purpose of the current review was to critically examine behavioral interventions for CSBD.

Behavioral interventions were considered the primary aim for this review for three reasons. First, while some pharmacological studies have been attempted, there is not an established theoretical model (or competing models) that explains the mechanisms of change associated with specific pharmacotherapy and CSBD outcomes. A better understanding of the neuroscience of CSBD will likely be necessary before such models are firmly established and rigorously tested through double blind randomized placebo-controlled trials. While the neuroscience of CSBD is a bourgeoning area [26–29], it has relied heavily on non-representative samples which consist mostly of cisgender White heterosexual men [30]. Second, and consistent with the state of the neuroscience of CSBD, almost all the pharmacological trials have relied on small samples, with majority being case reports involving *n's* = 1 [24••]. Third, past researchers have already examined the current state of CSBD pharmacology's elsewhere [see 24•• and 31 for reviews]. In sum, we agree with statements of Sniewski and colleagues [24••] that *the case for pharmacological approaches as a potential treatment option for* [CSBD] *lacks the scientific rigor necessary for widespread clinical implementation* (p. 220).

While to some degree small samples, participant diversity, and overall conceptual framework problems will be evident for behavioral interventions as well, there has proportionally been more research activity in the past 5 years. Accordingly, with a bigger empirical pool, we will be able to identify next steps towards research and treatment advances. We sought to broadly assess the state of the current literature of behavioral interventions for CSBD via literature review. In doing so, we aimed to identify gaps in the current literature and future directions for researchers to consider. Specifically, we were interested in conceptual issues (are researchers approaching CSBD treatment from the same perspective?), rigor issues (are the results from studies of CSBD interventions trustworthy?), and generalizability issues (for whom are the results from studies of CSBD interventions applicable?).

Method

We performed a series of literature searches using Google Scholar. Parameters were initially set to only include studies that were published after 2017. This threshold was chosen as the two most recent treatment reviews of CSBD-related constructs were each published in 2018 [24••, 25]. Various conceptually relevant search term combinations were used to identify potential studies. Search terms included "compulsive sexual behavior disorder behavioral intervention," "problematic pornography use intervention," and "hypersexual disorder intervention." Pages were searched until redundancy was evident. While we aimed to review recent (published within five years of 2022) studies of behavioral interventions for CSBD, we also performed an auxiliary search using similar term combinations for studies published prior to 2017. This was carried out to identify any exceptionally rigorous studies that might be useful in determining future research directions. Because the term CSBD was not formally adopted until 2022 [1•], we included studies that addressed conceptually consistent issues (e.g., hypersexuality and problematic pornography use) but did not include studies that addressed issues that would fall outside of current CSBD ICD-11 classification (e.g., internet addiction).

To be included in the review, manuscripts must contain outcome data of a behavioral intervention for CSBD or CSBD-consistent issue (e.g., problematic pornography use). We defined outcome data as having at a minimum of pre-treatment (or baseline) measurements of constructs of interest, accompanied by post-treatment data on the same indicators. Even if not explicitly stated (such as studies conducted prior to widespread usage of CSBD terminology), we also considered studies focused on problematic pornography use treatment to be appropriate for review.

Results

Initially, a pool of > 17,700 studies was suggested. However, redundancy became evident after roughly 400 study titles/abstracts were reviewed. In total, 19 studies were identified for initial review. Of these, six were removed because they involved single subject designs [32–34], examined issues conceptually outside of the CSBD definition (i.e., internet addiction, [35]), did not empirically test a behavioral intervention [36], and/or were more than 10 years old [37, 38]. One study was removed because they did not perform any inferential statistics or gather demographic information [39]. Two more studies were removed as they sampled

participants who had attended interventions for CSBD-related issues (12-step programs) but did not systematically test the effectiveness of the interventions [40, 41]. One additional study was removed because an English-language version of the paper was unavailable [42]. As such, 9 studies remained. Of these studies, 7 were published within 5 years of 2022 [43–49]. Two additional studies were kept due to their size and empirical/conceptual rigor [50, 51]. A list of all examined studies, demographics, designs, and primary outcomes is available on Table 1.

Review

Based on the current state of the literature, behavioral interventions are broadly shown to be effective at reducing CSB's and accompanying distress symptoms (e.g., perceptions that one's pornography use is *problematic*). Inferential statistics indicated significant decreases for all primary target measures in all but one case (results were trending in support of the intervention, but statistical power was likely hindered by the small sample size [47]). These results are consistent with less rigorous studies that were not included but nonetheless suggest support for behavioral interventions [25, 33, 36, 39, 40].

It is noteworthy that many of the reviewed studies utilized different treatment modalities such as individual therapy [50, 51], group therapy [46–49], internet-assisted interventions [43–45], and self-help modalities [43, 44]. Future research will be necessary to explore if robust differences in intervention efficacy is evident across modalities. At this time, it can safely be assessed that engaging in some form of behavioral intervention will likely help reduce CSBD. These results are hopeful and offer a base for future researchers to build. Concurrently, these studies suffer from several limitations. We offer the following recommendations for future researchers based on examining evident issues within the current body of treatment literature.

Conceptual Issues

While all the studies reviewed indicate support for CSBD behavioral interventions, almost none of them used identical psychometric instruments. Moreover, many of the studies addressed conceptually distinct aspects of CSBD. The most commonly assessed constructs were pornography use frequency, perceptions of problematic pornography use, and hypersexual behaviors. Importantly, in the case of the Hallberg and colleagues studies [48, 49], hypersexual behaviors were assessed via criteria for hypersexual disorder (an unofficial diagnosis under consideration by the American Psychiatric Association [6, 52]). Similarly, Holas and colleagues [47] initially screened participants based on the hypersexual disorder criteria but then measured self-perceived problematic pornography use, and time engage spent looking at pornography, masturbating, and engaging in sexual intercourse (they acknowledge that they had initiated their study before CSBD criteria were published). Accordingly, it will be important for future researchers to measure CSBD as a unified construct with validated symptom-severity measures. Moreover, unless there is a significant shift in the general understanding of CSB's, we recommend researchers move away from the hypersexual disorder criteria/measures and move toward CSBD conceptualization/measurement.

None of the studies holistically addressed CSBD as a unidimensional construct (as theorized to exist using ICD-11 criteria [1•]). This is a clear example of how prior research efforts have been hindered by the lack of a uniform definition. This problem can be addressed by researchers developing measures that uniformly assess CSBD, in addition to potential unique presentations (such as self-perceived problematic pornography use). Candidate measures have recently been developed including *the Individual-based Compulsive Sexual Behavior Scale* [53] and the *Compulsive Sexual Behavior Disorder Scale* [54]. Unfortunately, neither scale was used in any of the reviewed studies. Future research evaluating the efficacy of behavioral interventions are recommended to include these scales for establishing treatment targets.

More generally, the focus on problematic pornography use in most studies is not surprising. Indeed, problematic pornography use and pornography use in general are likely the most-researched behaviors that can be linked to CSBD [15••, 18]. We encourage continued study of problematic pornography use but also encourage researchers to consider other manifestations of CSBD. These might include examinations of compulsive masturbation (with/without pornography or webcams), use of sex hotlines, engagement with sex workers (e.g., prostitutes), and paraphilic activities. These dimensions of CSBD were either partially investigated in the reviewed studies or not examined at all. As such, the effectiveness of behavioral interventions for these dimensions of CSBD remains unclear. This is particularly important given the possibility that sub-presentations (those who engage in solitary vs. partnered sexual activity) may require different treatment approaches for addressing CSBD symptoms.

Consistent with this issue was the lack of an overarching theoretical model to treat CSBD. Most of the approaches fell under the umbrella of cognitive behavior therapy (CBT) [43, 45, 46, 48, 49] or acceptance and commitment therapy (ACT) [44, 50, 51]. Continued research into the mechanisms that cause CSBD will likely be necessary before more refined treatments can be employed. Regarding problematic pornography use, experiential avoidance has been proposed as a potential causal mechanism [55, 56], which may generalize well to other CSBD dimensions. That is,

Table 1 Behavioral Interventions for CSBD

Author(s)	Design	CSBD Issue	Nation	Sample *N*	%Men	Control	Length of treatment	Summary of outcome
Böthe et al. (2021)	RCT	PPU	37.9% USA, 15.5% UK, 7.6% CND	Initial: 264 Posttest: 86	96.2	Waitlist	6 online modules, plus a booster	Decrease in problematic pornography use, decrease in self-perceived pornography addiction, increase is pornography avoidance self-efficacy, decrease in past-seven-day pornography use, but no decrease in time spent using pornography per session in minutes, compared to control
FirooziKhojastehfar et al. (2021)	RCT	HB	Iran	20	100	Waitlist	8 weeks	Decrease in hypersexual behaviors compared to control
Holas et al. (2021)	NON-RCT	PPU	Poland	Initial: 13 Posttest: 5–10 (depending on scale)	100	None	8 weeks	Decrease in past week pornography use. Did not significantly decrease time spent masturbating or time spent in sexual intercourse. Did not significantly reduce perceptions of problematic pornography use. Not all participated in posttest measurement reducing power
Hallberg et al. (2020)	NON-RCT	HDw/wop	Sweden	Initial: 36 Posttest: 34 3-month follow-up: 25	100	None	10 modules over 12 weeks	Decrease in hypersexual behaviors, decrease in hypersexual disorder symptoms, decrease in sexual compulsivity, decrease in paraphilic concerns, 13 of the 36 participants completed all 10 modules
Hallberg (2019)	RCT	HD	Sweden	Initial: 108 Posttest: 97 3-month follow-up: 43 6-month follow-up: 25	100	Waitlist	7 weeks	Decreases in hypersexual disorder symptoms and sexual compulsivity compared to control
Levin et al. (2017)	NON-RCT	PPU	U.S.A	Initial: 19 Posttest: 11 8-week follow-up: 11	90	None	8 weeks	Decrease in time spent viewing pornography and decrease in perceived problematic porn use. Just over half the participants completed the intervention, with 45% of the completers reading at least half the book

Table 1 (continued)

Author(s)	Design	CSBD Issue	Nation	Sample *N*	%Men	Control	Length of treatment	Summary of outcome
Hallberg et al. (2017)	NON-RCT	HD	Sweden	Initial: 10 Posttest: 97 3-month follow-up: 43 6-month follow-up: 25	100	None	7–10 sessions	Decreases in hypersexual disorder symptoms at treatment conclusion. However, median HD:CAS scores were approaching pre-test values by 6-month follow-up
Crosby & Twohig (2016)	RCT	PPU	USA	Initial: 28 Posttest: 27 3-month follow-up: 25	100	Waitlist	12 sessions	Decrease in time spent viewing pornography, sexual compulsivity, and worries about the consequences of sexual behaviors compared to control
Twohig & Crosby (2010)	NON-RCT	PPU	USA	6	100	None	8 sessions	Decrease in time spent viewing pornography

Note: *RCT*, randomized control trial; *PPU*, problematic pornography use; *HB*, hypersexual behaviors; *HD*, hypersexual disorder; *HDw/wop*, hypersexual disorder with and without paraphilias; *HD:CAS*, hypersexual disorder current assessment scale. Studies arranged by publication year

maladaptive efforts to reduce CSB's (e.g., thought suppression) may exacerbate them (e.g., trying to not think about pornography is thinking about pornography [55]). As such, experiential approaches, such as ACT, may provide a hopeful path forward as they are designed to target transdiagnostic pathological mechanisms, including experiential avoidance [57]. Mindfulness-based approaches, which are conceptually similar to ACT, have been argued to potentially address CSBD for this reason as well [58], with Holas and colleagues providing evidence for such as an approach [47]. Future researchers are encouraged to continue testing these modalities, as well as adjusting protocols to be more conceptually relevant to CSBD.

Rigor Issues

Design issues pose a serious threat to internal validity across CSBD behavioral interventions. First, of the reviewed studies, less than half included a control group (four out of nine). As such, the causal mechanisms suggested by many of the interventions are suspect. As noted above, it could be that simply doing "something" will help reduce CSBD, regardless of what that "something" is in terms of intervention. Moreover, of the four studies that included a control condition, each comprised of a waitlist control. That is, no true treatment control condition (e.g., ACT for CSBD vs a 12-step program that addresses addiction issues more broadly) was employed in any of the trials.

This issue reflects an ongoing problem within behavioral science [59–61]. That is, the null hypothesis doing "something" is better than "nothing" is rather weak [59]. Multiple CSBD researchers across the reviewed trials did not even bother positing hypotheses, which we considered to be problematic. More preferably, researchers need to specify a priori how much decrease in CSBD symptoms they might expect from their intervention based on the theory guiding their intervention. Moreover, designs can be strengthened by including proper control conditions, such as a treatment as usual (TAU) condition or a non-directive therapy condition instead of a waitlist condition (or preferably including multiple types of controls). This should be considered a next step for CSBD behavior interventions, as such designs will significantly enhance the trustworthiness of significant outcomes.

Second, attrition/treatment adherence issues posed serious problems to multiple interventions. For instance, for Levin and colleagues' self-help intervention (based on ACT), only 11 participants completed the post assessment with 45% reporting having read "at least half of the book" (pg. 309 [44]). Participants went on to disclose that "not having enough time" and "lack of interest" were top reasons for treatment non-adherence, suggesting a core part of the intervention was not valued for many of the participants.

Bőthe and colleagues experienced a similar struggle. They initially started with $n = 123$ participants in their intervention group, with $n = 141$ for their waitlist control ($n = 264$ total) — easily the largest initial sample of any of the reviewed studies. However, they experienced a 65.5% attrition rate by 6-week follow-up, with a disproportionate amount dropping out in the treatment group (only 12.20% of the participants completed all six treatment modules) [43]. Traditional therapy approaches were more successful at preventing attrition but suffered from smaller initial samples [46, 50, 51]. Researchers are encouraged to consider client preferences when designing studies as well as to conduct more in-depth research (e.g., qualitative interviewing, surveys) to identify factors that contribute to high drop-off rates among help seeking clients.

Third, none of the reviewed studies provided long-term follow-ups. As such, none of the interventions should be considered a "cure," but rather short-term evidence-based interventions. At best, a handful of studies provided outcomes for at least 3-month follow-ups [45, 48–51] or in the case of Hallberg and colleagues, 6-month follow-ups [48, 49]. However, when 6-month follow-ups were conducted, attrition was highly problematic (as high as 76% [48]). Notwithstanding the difficulties in gathering long-term follow-up data, this is also a critical next step for CSBD treatment researchers.

Generalizability Issues

Perhaps, the most significant generalizability issue across studies was the overreliance on samples of men. Only two studies included women (representing less than 10% in either sample) [43, 44]. This is not surprising given the CSBD literature tends to focus on samples of men [15••, 30]. Current estimates of the number of women afflicted with CSBD vary considerably and are largely thought to be inaccurate due to problems with measurement [62]. As such, we echo the sentiments of Kowalewska and colleagues that more epidemiological research on CSBD is needed [62]. Continued research on women's CSBD will likely help elucidate necessary treatment considerations compared to men. Gender and cultural norms likely make it easier for men to seek treatment for CSBD compared to women [25, 63]. Researchers and clinicians should be sensitive to this issue and take active steps to better understand how CSBD differs across men and women. Similarly, considerations for non-cisgender individuals were not made across the reviewed studies. The broader literature on CSBD in the non-cisgender population is extremely limited. As noted by others [64], we recommend additional studies examining non-cisgender individuals in future CSBD studies.

Other diversity issues were also evident. All the samples reflected disproportionately heterosexual individuals and most of the studies were conducted on primarily White/European participants. No studies were conducted in Africa, South American, and Australia, among other regions of the world. Most were conducted in the USA, Central Europe, and Scandinavia, with one study taking place in Iran [46]. While religious diversity was not always measured, at least three samples were predominately composed of members of the Church of Jesus Christ of Latter-Day Saints [44, 50, 51]. As such, continued efforts are necessary to explore how sexual identity, race, ethnicity, nationality, and religion influence and intersect in the treatment of CSBD.

Beyond diversity of participants, there is a need for diversity of researchers. Examination of the authors/host institutions for each study suggests the reviewed CSBD interventions were conducted by only five different labs. While we would like to applaud members of those labs for conducting essential cutting-edge research, we strongly encourage more researchers to test their models/interventions. Increasing researcher diversity will help reduce possible bias. Moreover, the inclusion of double-blind studies where researchers are blinded will increase confidence in the findings. For example, the three ACT-based studies were all conducted by ACT scholars [44, 50, 51] with the primary researchers for the therapy trials also serving as the primary clinicians. While not always possible, a next step would be to have the researchers conducting the analyses be separate from those conducting therapy. Additionally, pre-registering hypotheses/analytic protocols will also reduce bias/boost confidence in results.

More broadly, large-scale effectiveness trials are needed to better understand how CSBD interventions perform in real-world settings. It is likely that most individuals seeking help for CSBD-related issues pursue clinicians who are not CSBD specialists. As such, research is needed to examine how generalist clinicians approach CSBD treatment with clients. Furthermore, it is likely that most generalist clinicians will not use validated protocols but rather incorporate concepts of evidence-based interventions into CSBD treatment. Further research is necessary to determine how such practices are associated with client outcomes.

Clinical Implications

Clinicians face several challenges when treating CSBD. At a nomenclature level, different historical terms lead to different pathways of conceptualizing and treating individuals with CSBD (e.g., addiction vs compulsion vs impulse). As noted, many terminologies have existed for what is now recognized as CSBD (e.g., hypersexuality, sex addiction, compulsive sexuality) and it is likely that many generalist clinicians use these terms interchangeably with the lay public [15••], leading to confusion around its appropriate classification. Clinicians are encouraged to take an interdisciplinary

approach when possible, but to be clear when discussing the presentation how the features are consistent with CSBD. We further encourage clinicians to use CSBD terminology in place of historical terms.

Given ongoing academic debate [14, 15••], it is possible the CSBD conceptualization may change in the future, particularly as it relates to diagnostic classification (e.g., whether CSBD remains classified as an impulse control disorder or is later reclassified as an addictive disorder). Given these complexities, it is incumbent upon clinicians to educate themselves about the sociocultural, familial, neuroscientific, and/or trauma-related aspects of CSBD. This is necessary to effectively treat differing presentations of CSBD, some of which may present more consistently as an impulse control disorder, whereas others may be more consistent with an addiction. Clinical judgement will likely be necessary to distinguish between presentations and to adjust treatment as necessary for each client.

As this review illustrates, there are numerous approaches to CSBD treatment. The treatment should be tailored to the specific presentation. For instance, determining whether a group approach might be appropriate for a certain client. Consultation and/or collaboration with sexual disorder and/or behavioral addiction specialists may be necessary in certain cases and is recommended. For example, collaboration with a urologist may be necessary if a client has damaged their anatomy as a result of possible CSBD (such as the cases presented by Mahadevappa and colleagues [65]).

While researchers continue to debate terms, clinicians must remain informed, non-judgmental, and sensitive to the distress associated with CSBD, as well as the impact this behavior has on individuals and their families. This is particularly important for sub-clinical presentations. For example, the larger body on morally incongruent pornography use has demonstrated that many individuals do not use pornography at a level that would meet diagnostic criteria [15••, 18, 66], yet the morally incongruent nature of the behavior for these individuals can cause significant psychological distress. Clinicians should be sensitive to these situations and integrate cultural/ideological themes into treatment. Similarly, there may be cases when the sexual behavior does not cause direct distress to the patient but rather causes indirect stress via a partner [67]. Clinicians are encouraged to take a system-level approach when necessary for such cases.

Clinicians will likely face increased numbers of clients with CSBD/CSBD-related issues. With Internet access, pornography use has increased significantly. In one recent study, 91.5% of men and 60.2% of women reported having consumed pornography in the past month [68]. Cybersex, "sexting," and sharing sexual self-images have become more commonplace, with many individuals considering their partner's engagement in such activities as infidelity [69]. As such, clinicians are challenged to familiarize themselves with the current state of the CSBD literature and to consider ways in which CSBD may evolve with changing technologies.

Conclusions

In conclusion, behavioral interventions for CSBD demonstrate minimum levels of evidence. All examined interventions are associated with significant CSBD symptom reductions across intervention types for those who complete the intervention. Despite these initial successes, numerous limitations are evident. Conceptually, none of the studies reviewed are measuring/treating CSBD as a unified construct but are rather addressing sub-dimensions (e.g., problematic pornography use) or using criteria based on unofficial diagnostic constructs (e.g., hypersexual disorder). Similarly, no overarching conceptualization for CSBD treatment has been developed. All the studies demonstrated significant reductions compared to nil hypotheses, but no studies included a treatment control condition. Future theoretically informed studies that demonstrate effectiveness beyond "treatment as usual" are necessary. Finally, generalizability issues were evident across studies. Participants were primarily cisgender heterosexual White men. Moreover, those conducting research on CSBD behavioral interventions came from only five different labs. Diversification of participants and researchers is recommended.

Many of the identified issues can be addressed by additional support from funding bodies. Remarkably, most of the researchers conducting the reviewed studies did not have financial support. Now that CSBD is recognized as a mental health diagnosis in ICD-11, funding will be necessary to support the recommended large-scale trials across diverse groups of people. We encourage funders to consider these recommendations during proposal review.

Declarations

Ethical Considerations The reviewed articles do not contain any subjects examined by the authors.

Conflict of Interest The authors declare no competing interests.

References

Papers of particular interest, published recently, have been highlighted as:
• Of importance
•• Of major importance

1.• International statistical classification of diseases and related health problems. 11th ed. World Health Organization; 2022. Available from: https://icd.who.int/. Accessed 3 Apr 2022. **Diagnostic criteria for CSBD**.

2.•• Kraus SW, Krueger RB, Briken P, First MB, Stein DJ, Kaplan MS, et al. Compulsive sexual behaviour disorder in the ICD-11. World Psychiatry. World Psychiatric Association; 2018 [cited 2022 Mar 31];17:109–10. Available from: /pmc/articles/PMC5775124/. **This article discusses many relevant issues to current CSBD concpetualization**.

3. Grant JE, Atmaca M, Fineberg NA, Fontenelle LF, Matsunaga H, Janardhan Reddy YC, et al. Impulse control disorders and "behavioural addictions" in the ICD-11. World Psychiatry. World Psychiatric Association; 2014 [cited 2022 Mar 31];13:127. Available from: /pmc/articles/PMC4102276/

4. Kingston DA, Firestone P. Problematic hypersexuality: a review of conceptualization and diagnosis. Sex Addict Compuls. Taylor & Francis Group; 2008 [cited 2022 Apr 5];15:284–310. Available from: https://doi.org/10.1080/10720160802289249

5. Kaplan MS, Krueger RB. Diagnosis, assessment, and treatment of hypersexuality. J Sex Res. Taylor & Francis Group; 2010 [cited 2022 Apr 5];47:181–98. Available from: https://doi.org/10.1080/00224491003592863

6. Kafka MP. Hypersexual disorder: a proposed diagnosis for DSM-V. Arch Sex Behav. Springer; 2010 [cited 2022 Apr 5];39:377–400. Available from: https://doi.org/10.1007/s10508-009-9574-7

7. Bancroft J, Vukadinovic Z. Sexual addiction, sexual compulsivity, sexual impulsivity, or what? Toward a theoretical model. J Sex Res. Taylor & Francis Group; 2010 [cited 2022 Apr 5];41:225–34. Available from: https://doi.org/10.1080/00224490409552230

8. Barth RJ, Kinder BN. The mislabeling of sexual impulsivity. J Sex Marital Ther. Taylor & Francis Group; 1987 [cited 2022 Apr 5];13:15–23. Available from: https://doi.org/10.1080/00926238708403875

9. Coleman E. Is your patient suffering from compulsive sexual behavior? Psychiatr Ann. SLACK, Inc.; 1992;22:320–5.

10. Goodman A. Diagnosis and treatment of sexual addiction. J Sex Marital Ther. Taylor & Francis Group; 1993 [cited 2022 Apr 5];19:225–51. Available from: https://doi.org/10.1080/00926239308404908

11. Levine SB. What is sexual addiction? J Sex Marital Ther. Taylor & Francis Group; 2010 [cited 2022 Apr 5];36:261–75. Available from: https://doi.org/10.1080/00926231003719681

12. Kuzma JM, Black DW. Epidemiology, prevalence, and natural history of compulsive sexual behavior. Psychiatr Clin N Am. Elsevier; 2008;31:603–11.

13. Kraus SW, Popat-Jain A, Potenza MN. Compulsive sexual behavior and substance use disorders. In: Balon R, Briken P, editors. Compuls Sex Behav Disord Understanding, Assessment, Treat. Washington DC: American Psychiatric Association; 2021 [cited 2022 Apr 15]. p. 21–34. Available from: www.webofmedical.com

14. Reed GM, First MB, Billieux J, Cloitre M, Briken P, Achab S, et al. Emerging experience with selected new categories in the ICD-11: complex PTSD, prolonged grief disorder, gaming disorder, and compulsive sexual behavior disorder. World Psychiatry. 2022.

15.•• Grubbs JB, Hoagland C, Lee BN, Grant JT, Davison PM, Reid RC, et al. Sexual addiction 25 years on: a systematic review of empirical literature on compulsive sexual behavior and an agenda for future research. Clin Psychol Rev. 2020;82:101925. **Comprehensive systematic review of findings relevant to CSBD**.

16. Insel T, Cuthbert B, Garvey M, Heinssen R, Pine DS, Quinn K, et al. Research domain criteria (RDoC): toward a new classification framework for research on mental disorders. Am J Psychiatry. American Psychiatric Association; 2010 [cited 2021 Aug 17];167:748–51. Available from: https://doi.org/10.1176/appi.ajp.2010.09091379

17. Kotov R, Waszczuk MA, Krueger RF, Forbes MK, Watson D, Clark LA, et al. The hierarchical taxonomy of psychopathology (HiTOP): a dimensional alternative to traditional nosologies. J Abnorm Psychol. American Psychological Association Inc.; 2017 [cited 2022 Apr 5];126:454–77. Available from: /record/2017-12889-001

18. Grubbs JB, Perry SL. Moral incongruence and pornography use: a critical review and integration. J Sex Res. Taylor & Francis; 2019;56:29–37. Available from: https://doi.org/10.1080/00224499.2018.1427204

19. Wordecha M, Wilk M, Kowalewska E, Skorko M, Łapiński A, Gola M. "Pornographic binges" as a key characteristic of males seeking treatment for compulsive sexual behaviors: qualitative and quantitative 10-week-long diary assessment. J Behav Addict. Akadémiai Kiadó; 2018 [cited 2022 Apr 5];7:433–44. Available from: https://akjournals.com/view/journals/2006/7/2/article-p433.xml. Accessed 3 Apr 2022

20. Ballester-Arnal R, Castro-Calvo J, Giménez-García C, Gil-Juliá B, Gil-Llario MD. Psychiatric comorbidity in compulsive sexual behavior disorder (CSBD). Addict Behav. Pergamon; 2020;107:106384.

21. Borgogna NC, Duncan J, McDermott RC. Is scrupulosity behind the relationship between problematic pornography viewing and depression, anxiety, and stress? Sex Addict Compuls. 2018;25:293–318.

22. Levin ME, Lillis JE, Hayes SC. When is online pornography viewing problematic among college males? Examining the moderating role of experiential avoidance. Sex Addict Compuls. 2012;19:168–80. Available from: http://search.ebscohost.com/login.aspx?direct=true&db=pbh&AN=79291881&site=ehost-live. Accessed 22 Apr 2022

23. Maddock ME, Steele K, Esplin CR, Hatch SG, Braithwaite SR. What is the relationship among religiosity, self-perceived problematic pornography use, and depression over time? Sex Addict Compuls. Routledge; 2019 [cited 2022 Apr 7];26:211–38. Available from: https://doi.org/10.1080/10720162.2019.1645061

24.•• Sniewski L, Farvid P, Carter P. The assessment and treatment of adult heterosexual men with self-perceived problematic pornography use: a review. Addict Behav. Elsevier; 2018;77:217–24. Available from: https://doi.org/10.1016/j.addbeh.2017.10.010. **Review of interventions for CSBD as of 2018**.

25. Efrati Y, Gola M. Treating compulsive sexual behavior. Curr Sex Health Rep. Springer; 2018 [cited 2022 Apr 15];10:57–64. Available from: https://doi.org/10.1007/s11930-018-0143-8

26 Stark R, Klucken T, Potenza MN, Brand M, Strahler J. A current understanding of the behavioral neuroscience of compulsive sexual behavior disorder and problematic pornography use. Curr Behav Neurosci Rep. 2018;5:218–31.

27. Kowalewska E, Grubbs JB, Potenza MN, Gola M, Draps M, Kraus SW. Neurocognitive mechanisms in compulsive sexual behavior disorder. Curr Sex Health Rep. Springer; 2018 [cited 2022 Apr 15];10:255–64.https://doi.org/10.1007/s11930-018-0176-z

28. Golec K, Draps M, Stark R, Pluta A, Gola M. Aberrant orbitofrontal cortex reactivity to erotic cues in compulsive sexual behavior disorder. J Behav Addict. Akadémiai Kiadó; 2021 [cited 2022 Apr 15];10:646–56. Available from: https://akjournals.com/view/journals/2006/10/3/article-p646.xml. Accessed 3 Apr 2022

29. Draps M, Kowalczyk-Grębska N, Marchewka A, Shi F, Gola M. White matter microstructural and compulsive sexual behaviors disorder – diffusion tensor imaging study. J Behav Addict.

Akadémiai Kiadó; 2021 [cited 2022 Apr 15];10:55–64. Available from: https://akjournals.com/view/journals/2006/10/1/article-p55.xml. Accessed 3 Apr 2022
30. Griffin KR, Way BM, Kraus SW. Controversies and clinical recommendations for the treatment of compulsive sexual behavior disorder. Curr Addict Rep. Springer Science and Business Media Deutschland GmbH; 2021 [cited 2022 Apr 15];8:546–55. Available from: https://doi.org/10.1007/s40429-021-00393-5
31. Verholleman A, Victorri-Vigneau C, Laforgue E, Derkinderen P, Verstuyft C, Grall-Bronnec M. Naltrexone use in treating hypersexuality induced by dopamine replacement therapy: impact of OPRM1 A/G polymorphism on its effectiveness. Int J Mol Sci. Multidisciplinary Digital Publishing Institute (MDPI); 2020 [cited 2022 Apr 15];21:3002. Available from: /pmc/articles/PMC7215378/
32. Fall KA, Howard RC. An Adlerian perspective on problematic internet pornography use. J Individ Psychol. 2015;71:273–89. Available from: https://muse.jhu.edu/journals/the_journal_of_individual_psychology/v071/71.3.fall.html. Accessed 22 Apr 2022
33. Ford JJ, Durtschi JA, Franklin DL. Structural therapy with a couple battling pornography addiction. Am J Fam Ther. 2012;40:336–48. Available from: https://doi.org/10.1080/01926187.2012.685003
34. Van Gordon W, Shonin E, Griffiths MD. Meditation awareness training for the treatment of sex addiction: a case study. J Behav Addict. Akadémiai Kiadó; 2016 [cited 2022 Apr 15];5:363–72. Available from: https://akjournals.com/view/journals/2006/5/2/article-p363.xml. Accessed 15 Apr 2022
35. Young KS. Cognitive behavior therapy with internet addicts: treatment outcomes and implications. Cyberpsychol Behav. 2007;10:671–9. Available from: http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Citation&list_uids=17927535
36. Zitzman ST, Butler MH. Attachment, addiction, and recovery: conjoint marital therapy for recovery from a sexual addiction. Sex Addict Compuls. 12:311–37.
37. Orzack MH, Voluse AC, Wolf D, Hennen J. An ongoing study of group treatment for men involved in problematic internet-enabled sexual behavior. CyberPsychol Behav. Mary Ann Liebert, Inc. 2 Madison Avenue Larchmont, NY 10538 USA ; 2006 [cited 2022 Apr 15];9:348–60. Available from: https://doi.org/10.1089/cpb.2006.9.348
38. Hardy SA, Ruchty J, Hull TD, Hyde R. A preliminary study of an online psychoeducational program for hypersexuality. Sex Addict Compuls. 2010;17:247–69.
39. Hall P, Dix J, Cartin C. The effectiveness of psycho-educational group work in treating compulsive sexual behavior disorder (CSBD): clinical outcomes using CORE OM and supplement at three-month and six-month follow up. Sex Addict Compuls. Routledge; 2020 [cited 2022 Apr 15];27:12–22. Available from: https://doi.org/10.1080/10720162.2020.1751364
40. Yamamoto M. Recovery from hypersexual disorder (HD): an examination of the effectiveness of combination treatment. Sex Addict Compuls. Routledge; 2020 [cited 2022 Apr 15];27:211–35. Available from: https://doi.org/10.1080/10720162.2020.1815267
41. Efrati Y, Gola M. Compulsive sexual behavior: a twelve-step therapeutic approach. J Behav Addict. Akadémiai Kiadó; 2018 [cited 2022 Apr 15];7:445–53. Available from: https://akjournals.com/view/journals/2006/7/2/article-p445.xml. Accessed 15 Apr 2022
42. FirooziKhojastehfar R, Asgari K, Kalantari M, Raisi F, Shahvari Z. Comparison of the effectiveness of cognitive–behavioral therapy and acceptance and commitment therapy on depression symptoms and hypersexual behaviours in patients with sex addiction - Journal of psychologicalscience. J Psychol Sci. 2021 [cited 2022 Apr 19];20:352–341. Available from: http://psychologicalscience.ir/browse.php?a_id=785&sid=1&slc_lang=en. Accessed 15 Apr 2022
43. Bőthe B, Baumgartner C, Schaub MP, Demetrovics Z, Orosz GA. Hands-off: feasibility and preliminary results of a two-armed randomized controlled trial of a web-based self-help tool to reduce problematic pornography use. J Behav Addict. Akadémiai Kiadó; 2021 [cited 2022 Apr 15];10:1015–35. Available from: https://akjournals.com/view/journals/2006/10/4/article-p1015.xml. Accessed 15 Apr 2022
44. Levin ME, Heninger ST, Pierce BG, Twohig MP. Examining the feasibility of acceptance and commitment therapy self-help for problematic pornography viewing: results from a pilot open trial. Fam J. SAGE PublicationsSage CA: Los Angeles, CA; 2017 [cited 2022 Apr 15];25:306–12. Available from: https://doi.org/10.1177/1066480717731242
45. Hallberg J, Kaldo V, Arver S, Dhejne C, Piwowar M, Jokinen J, et al. Internet-administered cognitive behavioral therapy for hypersexual disorder, with or without paraphilia(s) or paraphilic disorder(s) in men: a pilot study. J Sex Med. Elsevier; 2020;17:2039–54.
46. Firoozikhojastehfar R, Asgari K, Kalantari M, Raisi F, Shahvari Z, Dadras I, et al. A pilot randomized control of the efficacy of cognitive-behavioral therapy on depression and hypersexual behaviors in compulsive sexual behavior disorder. Sex Health Compuls. Routledge; 2021 [cited 2022 Apr 15];28:189–99. Available from: https://doi.org/10.1080/26929953.2022.2041514
47. Holas P, Draps M, Kowalewska E, Lewczuk K, Gola M. A pilot study of mindfulness-based relapse prevention for compulsive sexual behaviour disorder. J Behav Addict. Akadémiai Kiadó; 2020 [cited 2022 Apr 15];9:1088–92. Available from: https://akjournals.com/view/journals/2006/9/4/article-p1088.xml. Accessed 15 Apr 2022
48. Hallberg J, Kaldo V, Arver S, Dhejne C, Jokinen J, Öberg KG. A randomized controlled study of group-administered cognitive behavioral therapy for hypersexual disorder in men. J Sex Med. Elsevier; 2019;16:733–45.
49. Hallberg J, Kaldo V, Arver S, Dhejne C, Öberg KG. A cognitive-behavioral therapy group intervention for hypersexual disorder: a feasibility study. J Sex Med. Elsevier; 2017;14:950–8.
50. Twohig MP, Crosby JM. Acceptance and commitment therapy as a treatment for problematic internet pornography viewing. Behav Ther. 2010. 41:285–95. https://doi.org/10.1016/j.beth.2009.06.002
51. Crosby JM, Twohig MP. Acceptance and commitment therapy for problematic internet pornography use: a randomized trial. 2016. Available from: www.elsevier.com/locate/bt
52. American Psychiatric Association. Diagnostic and statistical manual of mental disorders, 5th Edition: DSM-5-TR. Washington, DC: American Psychiatric Association; 2022.
53. Efrati Y, Mario M. Individual-based compulsive sexual behavior scale: its development and importance in examining compulsive sexual behavior. J Sex Marital Ther. 2018 [cited 2019 Jul 15];44:249–59. Available from: https://doi.org/10.1080/009262 3X.2017.1405297
54. Böthe B, Potenza MN, Griffiths MD, Kraus SW, Klein V, Fuss J, et al. The development of the compulsive sexual behavior disorder scale (CSBD-19): an ICD-11 based screening measure across three languages. J Behav Addict. Akademiai Kiado Rt.; 2020 [cited 2020 Dec 22];9:247–58. Available from: https://akjournals.com/view/journals/2006/9/2/article-p247.xml. Accessed 15 Apr 2022
55. Borgogna NC, McDermott RC. The role of gender, experiential avoidance, and scrupulosity in problematic pornography

viewing: a moderated-mediation model. Sex Addict Compuls. 2018;25:319–44.
56. Levin ME, Lee EB, Twohig MP. The role of experiential avoidance in problematic pornography viewing. Psychol Rec. The Psychological Record; 2019;69:1–12. Available from: . http://librarysearch.swinburne.edu.au/primo_library/libweb/action/openurl?genre=article&issn=00332933&isbn=&title=The+Psychological+Record&volume=&issue=&date=2018&atitle=The+Role+of+Experie. Accessed 22 Apr 2022
57. Hayes SC, Strosahl K, Wilson KG. Acceptance and commitment therapy: an experiential approach to behavior change. New York: Guilford Press; 2012.
58. Blycker GR, Potenza MN. A mindful model of sexual health: a review and implications of the model for the treatment of individuals with compulsive sexual behavior disorder. J Behav Addict. Akadémiai Kiadó; 2018 [cited 2022 Apr 21];7:917–29. Available from: https://akjournals.com/view/journals/2006/7/4/article-p917.xml. Accessed 22 Apr 2022
59. Cohen J. The earth is round. Am Psychol. 1994;49:997–1003.
60. Popper K. The logic of scientific discovery. London: Hutchinson; 1959.
61. Oberauer K, Lewandowsky S. Addressing the theory crisis in psychology. Psychon Bull Rev. Springer New York LLC; 2019 [cited 2022 Feb 10];26:1596–618. Available from: https://doi.org/10.3758/s13423-019-01645-2
62. Kowalewska E, Gola M, Kraus SW, Lew-Starowicz M. Spotlight on compulsive sexual behavior disorder: a systematic review of research on women. Neuropsychiatr Dis Treat. Dove Medical Press Ltd; 2020 [cited 2020 Dec 21]; 15:2025–43. Available from: /pmc/articles/PMC7478918/?report=abstract. Accessed 22 Apr 2022
63. McKeague EL. Differentiating the female sex addict: a literature review focused on themes of gender difference used to inform recommendations for treating women with sex addiction. Sex Addict Compuls. Routledge; 2014 [cited 2022 Apr 22];21:203–24. Available from: https://doi.org/10.1080/10720162.2014.931266
64. Jennings T, Gleason N, Kraus S. Assessment of compulsive sexual behavior disorder among lesbian, gay, bisexual, transgender, and queer clients. J Behav Addict. 2022.
65. Mahadevappa N, Kochhar G, Vilvapathy KS, Dharwadkar S, Kumar S. Self-inflicted foreign bodies in lower genitourinary tract in males: our experience and review of literature. Urol Ann. Wolters Kluwer -- Medknow Publications; 2016 [cited 2022 Apr 29];8:342. Available from: /pmc/articles/PMC4944628/
66. Grubbs JB, Perry SL, Wilt JA, Reid RC. Pornography problems due to moral incongruence: an integrative model with a systematic review and meta-analysis. Arch Sex Behav. Springer US; 2019;48:397–415. Available from: https://doi.org/10.1007/s10508-018-1248-x
67. Zitzman ST, Butler MH. Wives' experience of husbands' pornography use and concomitant deception as an attachment threat in the adult pair-bond relationship. Sex Addict Compuls. 2009;16:210–40.
68. Solano I, Eaton NR, O'Leary KD. Pornography consumption, modality and function in a large internet sample. J Sex Res. Taylor & Francis; 2020 [cited 2022 Apr 29];57:92–103. Available from: https://doi.org/10.1080/00224499.2018.1532488
69. Whitty MT, Quigley LL. Emotional and sexual infidelity offline and in cyberspace. J Marital Fam Ther. Wiley; 2008 [cited 2022 Apr 29];34:461–8. Available from: https://doi.org/10.1111/j.1752-0606.2008.00088.x