

Psychiatric comorbidity in Compulsive Sexual Behavior Disorder (CSBD)

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Abstract

Compulsive Sexual Behavior Disorder (CSBD) is characterized by a persistent failure to control intense and recurrent sexual impulses, urges, and/or thoughts, resulting in repetitive sexual behavior that causes a marked impairment in important areas of functioning. Data collected from clinical populations suggest that CSBD frequently co-occurs with other Axis I and II psychiatric disorders; however, studies conducted so far suffer from methodological shortcomings that prevent the determination of accurate psychiatric comorbidity rates (e.g., small sample sizes, reliance on non-reliable assessment methods in the estimation of comorbidity or the non-inclusion of healthy individuals to compare prevalence rates). The purpose of this study was to explore psychiatric comorbidity in a sample of individuals with and without CSBD. The study sample comprised 383 participants distributed into two groups through a cluster analyses: 315 participants without CSBD (non-CSBD) and 68 qualifying as sexually compulsives (CSBD). Participants were assessed for co-occurring Axis I and II clinical conditions using structured clinical interviews for the DSM-IV (SCID-I and II). The majority of CSBD participants (91.2%) met the criteria for at least one Axis I disorder, compared to 66% in non-CSBD participants. CSBD participants were more likely to report an increased prevalence of alcohol dependence (16.2%), alcohol abuse (44%), major depressive disorder (39.7%), bulimia nervosa (5.9%), adjustment disorders (20.6%), and other substances –mainly cannabis and cocaine– abuse or dependence (22.1%). Concerning Axis II, prevalence of borderline personality disorder was significantly higher in CSBD participants (5.9%). As expected, prevalence of different psychiatric conditions was significantly increased among sexually compulsive participants, revealing comorbidity patterns with important implications in the conceptualization, assessment, and treatment of patients with CSBD.

Keywords: Compulsive Sexual Behavior Disorder (CSBD); psychiatric comorbidity; Axis I and II; cluster analysis.

1. INTRODUCTION

The appropriate diagnostic framework for out-of-control sexual behaviors is under debate, as evidenced by the numerous terminology employed to designate this clinical condition (e.g., «sexual addiction», «hypersexual disorder –HD–», «sexual compulsivity», or «problematic sexual behavior») and the different competing models proposed for its classification (Kafka, 2010; Walton et al., 2017). In this context, the World Health Organization (2018) has included Compulsive Sexual Behavior Disorder (CSBD) in the 11th revision of the International Classification of Diseases (ICD-11), providing clear diagnostic guidelines.

The ICD-11 characterizes CSBD as a “*persistent pattern of failure to control intense, repetitive sexual impulses or urges, resulting in repetitive sexual behaviour over an extended period (e.g., six months or more) that causes marked distress or impairment in personal, family, social, educational, occupational or other important areas of functioning*” (Kraus et al., 2018, p. 109). Another common feature of CSBD is the use of sex as a coping mechanism aimed to compensate for unpleasant affective states or stressful life events (Kafka, 2010). These out-of-control sexual behaviors lead to engage in multiple and non-pleasurable sexual activities, including excessive pornography consumption often accompanied by compulsive masturbation (“pornographic binges”) (Wordecha et al., 2018), casual sex with multiple partners, excessive engagement in paid sexual services, or compulsive sexual intercourse within a stable relationship (Reid et al., 2012; Wéry et al., 2016). CSBD produces a significant personal and psychological distress (Reid et al., 2009), as well as problems on various aspects of daily living (McBride et al., 2008). As a result, individuals struggling with CSBD often require psychiatric and/or psychological treatments to gain control over

their sexual behavior (Derbyshire & Grant, 2015). It is estimated that CSBD affects 1-6% of adult population (Böthe et al., 2019; Walton et al., 2017).

1.1 Psychiatric comorbidity in CSB

Data collected from clinical populations suggest that CSBD frequently co-occurs with other Axis I a II psychiatric disorders (Kraus et al., 2016). In the first study exploring Axis I diagnoses in a sample of 26 males presenting a “paraphilia-related disorder” (equivalent to HD), Kafka and Prentky (1994) found that 80.8% had a lifetime mood disorder, 46.2% an anxiety disorder, 46.2% a Substance Use Disorder (SUD), and 7.7% an impulse control disorder. Similar comorbidity rates were found in subsequent studies with 18 (Kafka & Prentky, 1998) and 32 CSBD patients (Kafka & Hennen, 2002). In a study where 36 subjects with CSBD were interviewed using computerized semi-structured clinical interviews, Black et al. (1997) found that 83% had a history of at least one Axis I disorder and 61% of more than one (psychiatric multimorbidity). Personality disorders were also prevalent, particularly histrionic (21%), obsessive-compulsive (15%), and borderline (9%) subtypes. Using structured clinical interviews on a sample of 25 patients self-identified as sexually compulsive, Raymond et al. (2003) found that 100% met criteria for a lifetime Axis I disorder. Lifetime prevalence of anxiety disorders was 96%, whereas prevalence of SUD and mood disorders was 71%. More recently, Kraus et al. (2015) examined psychiatric comorbidity in a sample of 103 men seeking treatment for compulsive pornography use and/or casual sexual behaviors. These researchers found that 94% met criteria for at least one psychiatric comorbid disorder.

Other studies found considerably lower rates of psychiatric comorbidity in CSBD. In a study where 43 members of the German Society of Sex Research reported

their experience in the treatment of 97 individuals with CSBD, prevalence of ICD-10 diagnosis of comorbid neurotic disorder was 36%, 16% of mood disorders, and 15% of SUD (Briken et al., 2007). Similarly, less than a half of a sample of 86 men seeking treatment for CSBD experienced a comorbid anxiety disorder, 36% a mood disorder, 14% a SUD and 12% an impulse control disorder (Scanavino et al., 2013).

The quality of the research greatly varies, but the majority of the revised studies suffer from at least one of the following methodological shortcomings: (1) small sample sizes, (2) reliance on self-report assessment instruments or non-validated clinical interviews in the estimation of Axis I and II comorbidity, and/or (3) the non-inclusion of healthy individuals to compare resulting prevalence rates (Starcevic & Khazaal, 2017). A notable exception is the study conducted by Odlaug et al. (2013). In this research, 36 participants qualifying as sexually compulsive and 1,801 participants without CSBD were screened for comorbid Axis I conditions. Surprisingly, significant differences emerged only for one disorder: social anxiety (17% in CSBD participants; 4% in non-CSBD). Similarly, Engel et al. (2019) compared psychiatric comorbidity in 47 participants with HD and 38 healthy volunteers, finding that both groups only differed in the prevalence of depression and ADHD. In conclusion, current evidence prevents the determination of accurate psychiatric comorbidity rates in CSBD.

The purpose of the present study was to explore psychopathological comorbidity in a large sample of individuals with and without CSBD. Subjects were assessed for co-occurring Axis I and II clinical conditions using structured clinical interviews for the DSM-IV (SCID-I and II). Two a priori hypothesis were tested. Because current evidence suggest that CSBD may be classified as an addictive disorder beyond other competing models (Gola et al., 2017; Kowalewska et al., 2018; Kraus et al., 2016; Potenza et al., 2017) and SUDs are common in this population (Reid & Meyer, 2016), it

was hypothesized that prevalence of SUDs would be significantly higher in CSBD participants. To the extent that CSBD patients tend to use sex as a coping mechanism (Kafka, 2010; Lew-Starowicz et al., 2019; Schultz et al., 2014), we also hypothesized that prevalence of disorders where emotional dysregulation plays an important role would be increased in CSBD participants.

2. METHODS

2.1 Participants and procedure

Data acquisition was conducted between 2012 and 2015. A two-phase targeted sampling was used to ensure the recruitment of participants qualifying for CSBD.

During a first phase, we used a cross-sectional, street intercept survey method to collect data on a large convenience sample of college students. The research team set an information table in the main entrance of different higher education centers and a member of the team actively approached potential participants. Students were asked to voluntarily collaborate with a research on sexual behavior. Those who accepted completed a brief paper-and-pencil survey on basic demographic information (sex, gender, etc.) and CSBD symptoms (see composite index of CSBD symptoms in the measures section) that we employed during the second study round to select participants. Around 1,581 students completed the first study phase.

The second study phase implied an individual in-office assessment where an experienced clinical psychologist administered two structured clinical interviews (the Structured Clinical Interview for DSM-IV-TR Axis I and Axis II disorders) and a self-report instrument (the Beck Depression Inventory). In this phase, we prioritized the assessment of those participants displaying more CSBD symptoms during the previous study phase. Given that this second assessment was more time consuming (each individual assessment took around 1-2 hours), sampling objective for this phase was

limited to 400 participants. From those participants from the first study round invited to take part in this second study round, 383 participants (95.75% of the sampling objective) agreed and completed the second study phase (definitive study sample).

2.2 Instruments

2.2.1 Participant characteristics

Participants were asked to report their gender, age, whether they were engaged or not in a stable relationship, sexual orientation, and religious beliefs.

2.2.2 Composite index of CSBD symptoms

CSBD signs and symptoms were assessed through a new composite index based in three previously validated scales: the Hypersexual Behavior Inventory (HBI, Ballester-Arnal et al., 2019; Reid et al., 2011), the Sexual Compulsivity Scale (SCS, Ballester-Arnal et al., 2013; Kalichman & Rompa, 1995), and the Sexual Addiction Screening Test (SAST, Castro-Calvo et al., 2018; Carnes, 1983). Independently, these measures tend to be excessively narrow in the assessment of CSBD symptoms, not covering the wide range of criteria that should be explored to accurately assess this clinical condition (Womack et al., 2013); however, altogether these scales offer a comprehensive assessment of CSBD symptoms and severity.

In a previous study, we developed and tested psychometric properties of a new composite index to assess the whole range of CSBD symptoms relying on these three previously validated scales (Castro-Calvo et al., 2020). This composite index assessed the following criteria: (a) loss of control over sexual behavior, (b) neglecting health and personal care or other interests, activities, and responsibilities due to sexual behavior, (c) repetitive but unsuccessful efforts to control or significantly reduce sexual fantasies, urges or behaviors, (d) continued engagement despite interference, (e) use of sex to cope with unpleasant emotional states, and (f) preoccupation, salience, and self-

perceived sexual problems. Reliability for this composite index ranged between .67-.89 (paper-and-pencil format) and .68-.91 (online version). In the present study, reliability for the total score ($\alpha=.93$) and criteria (α between .70 and .88) was appropriate.

2.2.3 Lifetime prevalence of Axis I and Axis II disorders

We employed the Structured Clinical Interview for DSM-IV-TR in assessing comorbid Axis I (First et al., 1999) and Axis II disorders (First et al., 1999). The SCID-I is broken down into seven separate modules corresponding to the main DSM-IV-TR diagnostic categories: a) psychotic disorders, b) mood disorders, b) substance use disorders, c) anxiety disorders, d) somatoform disorders, e) eating disorders, and f) adjustment disorders. Having a major psychiatric disorder (i.e. schizophrenia or other psychotic disorders) was considered as an exclusion criterion, so results from the interview module assessing these clinical conditions are not provided. The SCID-II assesses the 10 DSM-IV-TR personality disorders. However, only two of these disorders were explored in this research: the borderline personality disorder and the obsessive-compulsive personality disorder. The other personality disorders were not screened because of: (a) their low prevalence in individuals with CSBD (Carpenter et al., 2013) and (b) the large amount of time required to assess all the DSM-IV-TR personality disorders.

2.2.4 Current depressive symptoms

The presence and severity of depressive symptoms during the last two weeks were assessed through the Spanish version of the Beck Depression Inventory (BDI-II, Beck et al., 2011). This scale is comprised by 21 items rated on a 4-point Likert scale ranging from 0 to 3. The total score, ranging from 0 to 63, may be used for classifying individuals into clinical categories: in particular, we used a cutoff score of 18 for

identifying participants with moderate to severe depressive symptoms (Shean & Baldwin, 2008). In the present research, Cronbach's alpha was .89.

2.3 Data analysis

Statistical data analysis was performed with SPSS (version 25.0). To identify subgroups of subjects with CSBD, we conducted a hierarchical cluster analysis. Considering the preliminary nature of proposed CSBD criteria (Kraus et al., 2018; Walton et al., 2017) and the precarious development of cutoff scores for available diagnostic scales (Miner et al., 2017), this data-driven approach presents advantages in the identification of this clinical population over alternative methods (e.g., avoiding the use of arbitrary cutoff scores or relying on the self-perception of sexual problems). The six subscales derived from the composite index to assess CSBD were employed as clustering variables in this analysis. As recommended (Hair et al., 2010; Henry et al., 2005), clustering was addressed by combining hierarchical and non-hierarchical clustering strategies. At a first step, a hierarchical cluster analysis was conducted (Ward's method, Euclidian distance measurement) to propose a tentative estimation of the number of homogeneous clusters in the dataset on the basis of the agglomeration schedule and the dendrogram. Then, the optimal number of CSBD profiles and the cluster membership were determined using a two-step cluster classification method. Two indices were used to assess the goodness of fit of the proposed cluster solution in comparison with competing models ranging from 1 to 10 clusters: the Akaike Information Criterion (AIC) and the Bayesian Information Criterion (BIC). Despite its simplicity, this "auto-cluster" procedure has demonstrated its superiority to other more complex estimation methods in determining the optimal number of clusters to be retained (Eshghi et al., 2011; Gelbard et al., 2007).

To confirm the accuracy of the cluster solution, we then compared participants' characteristics (demographics and scores on the six CSBD subscales) in the resulting clusters: *t* tests were conducted for continuous variables, and chi-square tests for categorical variables. Two effect size indices (Cohen's *d* and Cramer's *V*) were computed by using G*Power (version 3.1). For Cohen's *d*, effect sizes of about .20 were considered small, close to .50 moderate and greater than .80 large (Cohen, 1988); for Cramer's *V*, these sizes corresponded to values of .10, .30 and .50 (Ellis, 2010).

Finally, we analyzed the psychopathological comorbidity in CSBD by calculating and comparing the prevalence of 16 Axis I and 2 Axis II disorders in the resulting clusters (chi-square test, Cramer's *V* effect size).

3. RESULTS

3.1 Identification and description of participants with and without CSBD

The study sample comprised 383 participants aged between 18-27 years old. To identify subgroups of participants with similar CSBD profiles, a hierarchical cluster analysis was performed, revealing that the appropriate number of clusters to be considered was 2. The subsequent two-step method as well as the analysis of the BIC and AIC values confirmed the same cluster solution. Cluster 1 (labelled "non-CSBD") consisted of 315 participants (85.6% of the sample; 54.9% females; $M_{\text{age}}=20.89$) displaying a low-CSBD risk profile; cluster 2 ("CSBD") included 68 subjects (14.4% of the sample; 33.8% females; $M_{\text{age}}=20.63$) with a high-CSBD risk profile. Table 1 shows participants' characteristics in both clusters.

INSERT TABLE 1

The accuracy of this 2-cluster solution in identifying CSBD patients was assessed by comparing scores of participants in both clusters on the six CSBD subscales

(table 1). Participants in the CSBD cluster significantly differed from non-CSBD participants in their scores on the six symptoms subscales ($p<.001$; $d>1.21$).

INSERT TABLE 1

3.2 Axis I and Axis II disorders in CSBD

Axis I and Axis II lifetime diagnoses of participants in both clusters are listed in table 2. The majority of CSBD participants met the criteria for at least one Axis I disorder at some time in their lives (91.2% vs 66% in non-CSBD participants; $V=0.21$). In particular, CSBD participants were more likely to report an increased prevalence of alcohol dependence (16.2% vs 1.9%; $V=0.26$), alcohol abuse (44.1% vs 25.9%; $V=0.15$), major depressive disorder (39.7% vs 22.8%; $V=0.14$), bulimia nervosa (5.9% vs 0.9%; $V=0.14$), adjustment disorders (20.6% vs 9.2%; $V=0.13$), and other substances –mainly cannabis and cocaine– abuse or dependence (22.1% vs 12.7%; $V=0.10$). Similarly, we found a significant difference in prevalence of current moderate to severe depression assessed by means of the BDI (19.4% vs. 4.8%; $V=0.21$). Concerning Axis I psychiatric multimorbidity, the mean number of lifetime diagnosis in non-CSBD participants was 1.13 ($SD=1.04$) compared to 2.02 ($SD=1.31$) in CSBD subjects ($d=0.75$).

INSERT TABLE 2

When assessing Axis II disorders, significant differences between participants in both clusters emerged only in one of the clinical conditions: Borderline Personality Disorder (BPD). In particular, 5.9% of the CSBD participants presented a BPD compared to 0.3% in non-CSBD participants ($V=0.18$).

4. DISCUSSION

The main aim of this study was to explore and compare psychiatric comorbidity in a representative sample of 383 individuals with and without CSBD. As expected, the prevalence of different Axis I and Axis II clinical conditions was significantly higher among sexually compulsive participants. Additionally, this research reveals interesting comorbidity patterns with important implications in the assessment, classification, and treatment of people displaying this clinical condition.

As hypothesized, greater differences between participants with and without CSBD were found in the prevalence of substance use disorders. Prevalence of alcohol abuse and dependence among sexually compulsive participants was notably high (44% and 16%) and even more concerning due to its legal and health impact: 22% of sexually compulsive participants abused or were dependent on other (illegal) substances, mainly cannabis and/or cocaine. Considering that sample recruited in this study was young (around 20 years old), that peak rates of SUDs often occur later in life (between late-20s and early-30s) (Chassin et al., 2016; Kessler et al., 2005), and that some individuals display a continuous positive evolution in the risk of developing a SUD from late adolescence to adulthood (Kosty et al., 2017), prevalence and severity of comorbid SUDs documented in our study may continue increasing over time. Thus, these results highlight the relevance of exploring substances abuse and dependence symptoms during initial assessment of individuals with CSBD, as well as addressing communalities between both conditions during clinical interventions. In this line, a recent study by Zilberman et al. (2018) found that people with SUDs and CSBD were surprisingly similar in terms of personality profile, in both cases scoring lower in agreeableness and conscientiousness. This overlap between CSBD and SUDs may explain why conservative and often criticized therapeutic approaches originally developed for recovery from SUDs (i.e., the 12-step approach) are demonstrating their

efficacy when applied to CSBD (Efrati & Gola, 2018a, 2018b). Given that clinical conditions within the same diagnostic category tend to display an increased comorbidity (Borsboom, 2017), at a theoretical level, these results support the conceptualization of CSBD as an addictive disorder beyond other competing models (Potenza et al., 2017).

Similarly, prevalence of clinical conditions where emotion regulation plays an important role was increased among CSBD individuals. Around 40% of CSBD participants was diagnosed with a lifetime major depressive disorder, 20% with a current moderate to severe depression, 21% with a lifetime adjustment disorder, and 6% with a bulimia nervosa. The prevalence of BPD was also significantly increased among sexually compulsives (5.9% compared to 0.3%). These results confirm our second hypothesis, and further emphasizes the relevance of the use of sex as a maladaptive coping mechanism in people with CSBD (Schultz et al., 2014). Because current evidence demonstrates that impaired emotion regulation contributes to the development and severity of SUDs and other excessive and problematic behaviors (Kober, 2014; Villani & Carissoli, 2018), these results also support the usefulness of the addiction paradigm in explaining CSBD (for a comprehensive discussion on the role of emotion regulation difficulties as a mechanism underlying CSBD co-occurrence with other mental-health conditions, see Lew-Starowicz et al., 2019). At a clinical level, the presence of this underlying vulnerability factor justifies the development of new therapeutic approaches aimed to promote healthy emotion regulation strategies (e.g., mindfulness-based interventions [Blycker & Potenza, 2018] or cognitive analytic therapy [Efrati & Gola, 2018b]). In this regard, psychological interventions including emotion regulation strategies showed promising results in reducing CSBD symptoms (Efrati & Gola, 2018b).

Concerning psychiatric multimorbidity, this study confirms that individuals struggling with CSBD often present multiple clinical conditions with a negative impact on different aspects of daily life. In this regard, mean number of Axis I clinical conditions among sexually compulsive participants was around two, 60% presented two or more concurrent diagnoses (in addition to CSBD) and 12% more than three. These results resonate with a recent study conducted by Baggio et al. (2018) using a network approach. In this study, authors confirmed the presence of a stable network of cybersex addiction symptoms; in turn, this network was strongly linked to other clinical conditions by bridge symptoms related to mood management, continued use despite negative consequences, and loss of control. If we generalize results from this research to explain comorbidity rates obtained in our study, it seems plausible that impaired control over general and/or sexual behavior and problems in emotion regulation may play a crucial role as bridge symptoms connecting CSBD, SUDs, and other clinical conditions (such as BPD, major depressive disorder, or bulimia nervosa).

Similar to previous comorbidity studies (Black et al., 1997; Kafka & Hennen, 2002; Kafka & Prentky, 1994, 1998; Kraus et al., 2015; Raymond et al., 2003; Scanavino et al., 2013), prevalence of anxiety disorders among sexually compulsives was low, and did not differ from that obtained in non-CSBD participants. Lifetime prevalence of SUDs was similar to that reported in the series of studies by Kafka and colleagues (Kafka & Hennen, 2002; Kafka & Prentky, 1994, 1998) or in other comorbidity studies conducted on different populations (compulsive pornography users, Kraus et al., 2015; gay and bisexual men, Morgenstern et al., 2011) but lower than those reported in other studies (Black et al., 1997; Raymond et al., 2003). These mixed results emerge again when we compare the prevalence of the rest of conditions explored in our research. These discrepancies may be due either to the characteristics of participants in

previous studies (typically, older than participants in our research), the use of different methodologies, or the presence of methodological issues (Starcevic & Khazaal, 2017).

4.1 Limitations and future directions

Despite a number of interesting and novel findings, this study was limited in different ways. First, this research is correlational and therefore, do not address whether CSBD increases the risk of suffering other psychological conditions or, on the contrary, the presence of other disorders increases the vulnerability to develop signs and symptoms of CSBD. Additionally, CSBD profile was determined through a new composite index that we then employed to conduct a cluster analysis. However, even when the reliability of this data-driven classification was confirmed in a previous study comprising two independent community samples (Castro-Calvo et al., 2020), CSBD diagnosis actually requires a more in-depth assessment of the nature and context of individual's sexual problems. Another problem in our study is that the SCID interview does not explore other common comorbid conditions in CSBD, such as paraphilias and sexual disorders (Wéry et al., 2016), attention-deficit/hyperactivity disorder (Blankenship & Laarser, 2004), or impulse control disorders (Grant & Steinberg, 2005).

5. CONCLUSIONS

Since the inclusion of CSBD in the ICD-11, this clinical condition is becoming widely studied. However, further research is needed to confirm and consolidate existing findings in the field, in particular regarding its clinical presentation. Data collected from clinical populations suggest that CSBD frequently co-occurs with other Axis I and II psychiatric disorders (Kraus et al., 2016); however, studies conducted so far suffer from methodological shortcomings and the results from researches using different experimental approaches are mixed, thus preventing the determination of accurate psychiatric comorbidity rates. In this context, our study provides further evidence that

psychiatric comorbidity is very common among patients with CSBD. In particular, patients with CSBD are more likely to qualify for SUDs, major depressive disorder, bulimia nervosa, adjustment disorders, and borderline personality disorder. An in-depth analysis of the comorbidity patterns revealed that the two key features characterizing these comorbid conditions are: a) lack of control over the behavior and b) emotion regulation problems. Both aspects (typically present in SUDs and other behavioral addictions) support the use of the addiction paradigm when explaining CSBD, providing important insights on how this clinical condition should be conceptualized and treated.

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Table 1. Participants' characteristics

	Cluster 1 (non-CSBD, n = 315)	Cluster 2 (CSBD, n = 68)	Inferential statistic	Effect size
Sociodemographic data				
Sex (male)	45.1%	66.2%	$\chi^2 = 9.96^{***}$	$V = 0.16$
Sex (female)	54.9%	33.8%		
Age	20.89 (2.12)	20.63 (2.26)	$t = 0.90$	$d = 0.11$
Steady partner (yes)	57.8%	47.1%	$\chi^2 = 2.60$	$V = 0.08$
Religious beliefs (atheist)	61.8%	65.7%	$\chi^2 = 2.83$	$V = 0.09$
Religious beliefs (practicing believer)	7%	2.9%		
Religious beliefs (non-practicing believer)	27.3%	35.3%		
Sexual orientation (heterosexual)	88.9%	75.0%	$\chi^2 = 9.91^{**}$	$V = 0.16$
Sexual orientation (bisexual)	3.5%	10.3%		
Sexual orientation (homosexual)	7.6%	14.7%		
CSBD signs and symptoms (composite index) ^a				
Loss of control	-0.06 (0.48)	1.32 (0.73)	$t = -19.15^{***}$	$d = 2.23$
Neglect	-0.11 (0.51)	1.36 (0.83)	$t = -18.81^{***}$	$d = 2.13$
Unable to stop	0.06 (0.74)	1.57 (0.96)	$t = -14.32^{***}$	$d = 1.90$
Engagement despite interference	-0.01 (0.39)	1.00 (0.71)	$t = -16.30^{***}$	$d = 1.76$
Coping	0.06 (0.66)	1.02 (0.83)	$t = -10.23^{***}$	$d = 1.28$
Preoccupation, salience, and self-perceived severity	0.03 (0.52)	1.37 (0.64)	$t = -18.16^{***}$	$d = 2.29$

Note: ** $p < .01$; *** $p < .001$; a = To share a common metric, composite index means are expressed as z-scores (higher z-scores indicate a greater severity of CSBD symptoms).

Table 2. Lifetime prevalence of different Axis I and II clinical conditions in non-CSBD and CSBD participants

Symptoms scale	Cluster 1 (non-CSBD, n = 315)	Cluster 2 (CSBD, n = 68)	χ^2	V
Lifetime prevalence of any Axis I clinical condition (SCID-I)	66%	91.2%	17.00***	0.21
Substance-related disorders				
Alcohol abuse	25.9%	44.1%	8.94**	0.15
Alcohol dependence	1.9%	16.2%	26.96***	0.26
Other substances abuse or dependence	12.7%	22.1%	3.98*	0.10
Mood disorders				
Major depressive disorder (single episode or recurrent)	22.8%	39.7%	8.37**	0.14
Dysthymic disorder	2.2%	5.9%	2.70	0.08
Anxiety disorders				
Panic disorder (with or without agoraphobia)	4.1%	5.9%	0.41	0.03
Agoraphobia without history of panic disorder	0.9%	1.5%	0.14	0.02
Specific phobia	18.4%	19.1%	0.02	0.01
Social phobia	4.4%	10.3%	3.72	0.10
Obsessive-compulsive disorder	2.5%	5.9%	2.07	0.07
Posttraumatic stress disorder	2.8%	5.9%	1.57	0.06
Somatoform disorders				
Hypochondriasis	0.9%	2.9%	1.72	0.06
Body dysmorphic disorder	2.2%	4.4%	1.06	0.05
Eating disorders				
Anorexia nervosa	1.3%	0%	0.87	0.04
Bulimia nervosa	0.9%	5.9%	7.60**	0.14
Adjustment disorders				
Adjustment disorder (all the subtypes)	9.2%	20.6%	7.32**	0.13
Axis I psychiatric multimorbidity				
Participants with history of ≥ 2 Axis I clinical conditions	34.3%	60.3%	15.91***	0.20
Participants with history of ≥ 4 Axis I clinical conditions	1.6%	11.8%	17.66***	0.21
Lifetime prevalence of any Axis II clinical Condition (SCID-II)	5.1%	14.7%	8.24**	0.14
Borderline personality disorder	0.3%	5.9%	13.48***	0.18
Obsessive-compulsive personality disorder	4.7%	8.8%	1.79	0.06
Current depression diagnosis through the BDI				
Moderate to severe depression (scores ≥ 18)	4.8%	19.4%	17.17***	0.21

Note: SCID = Structured Clinical Interview for DSM-IV; BDI = Beck Depression Inventory; *p < .05; **p < .01; ***p < .001