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An integrated model to assess and treat compulsive sexual behaviour disorder

Peer Briken

Abstract | Contrary to common belief, hypersexual or compulsive sexual behaviour disorder is not a current fashion diagnosis. Nevertheless, the introduction of dedicated diagnostic guidelines for International Classification of Diseases 11th Revision (ICD-11) brings an opportunity for more accurate diagnosis and, therefore, improved research into the disorder's aetiology, assessment and therapy. A considerable proportion of both men and women consider themselves to have a problem with pornography and an even greater proportion experience their sexual behaviour as insufficiently controllable. For these people, the interplay between excitatory and inhibitory factors could be in dysbalance. In this context, biological correlates are important, but social factors, such as negative attitudes towards pornography or hostile attitudes to sexuality, also have a role. In patients with compulsive sexual behaviour disorder, excessive pornography consumption, masturbation and/or promiscuity that are out of control and lead to distress and impairment are usually present. Differential diagnoses, such as neuropsychiatric syndromes that can exhibit hypersexuality as a symptom, such as frontal lobe lesions, should be investigated and treated, as should comorbid disorders such as depression. Therapeutic approaches can be based on the Dual-Control Model and the Sexual Tipping Point Model. In each patient, an individualized therapeutic approach is multimodal and includes psychopharmaceuticals such as selective serotonin reuptake inhibitors and naltrexone as well as specific psychotherapeutic approaches. The efficacy of some therapeutic approaches has now also been supported by initial randomized controlled trials in this patient population.

The publication of the International Classification of Diseases 11th Revision (ICD-11)[1,2], almost 30 years after the previous version was published, provides a good opportunity to consider the data surrounding compulsive sexual behaviour disorder (CSBD). The concomitant process of creating and discussing the criteria has also rekindled the process of creating aetiologically based models and researching therapy. This increased interest in the disorder is accompanied by the fact that during the past 20 years the rise of online media access has increased the number of people using online pornography and considering their use to be out of control[3].

Proposals for the inclusion of hypersexual disorder in the manual of American Psychiatrists DSM-5 (REF.[4]) and the development process of the ICD-11 (REFS[1,2]) have increased the number of studies on these disorders and inspired theoretical considerations. These considerations have also led to criticism of the concepts regarding pathological dysregulated sexual behaviours[5].

This Review provides an overview of the current state of knowledge, as well as proposing an integrated model for understanding the pathogenesis of CSBD and its therapeutic approaches, helping to inform clinicians of the starting points for therapeutic interventions and improve their referral competence. The Review also presents the current state of research and perspectives for future work. Note that this Review uses the term 'compulsive sexual behaviour' (CSB) to describe compulsive or hypersexual behaviour that does not fulfil the criteria of a psychiatric disorder, whereas CSBD is reserved for the forms in which the sexual behaviour causes marked distress or substantial impairment of daily life.

Historical development

In order to understand the current controversy surrounding CSB, understanding its historical derivation is essential. From the middle of the nineteenth century, practitioners of medicine, and psychiatry in particular, began to turn their attention to quantitative and

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https://doi.org/10.1038/s41585-020-0343-7

Key points

- Compulsive sexual behaviour disorder (CSBD) is characterized by a persistent pattern of failure to control intense, repetitive sexual impulses or urges resulting in repetitive sexual behaviour accompanied by distress or significant impairment.
- New, precise guidelines for CSBD have been developed for the International Classification of Diseases 11th Revision (ICD-11), which will facilitate the differentiation from normal variants of sexual behaviour and differential diagnostic disorders, such as increased libido in manic episodes or hypersexuality in frontal brain syndrome.
- The current concept of CSBD can be well supported by common theoretical assumptions on sexual behaviour such as the Dual Control Model and the Sexual Tipping Point Model.
- These theoretical models, as well as the knowledge of comorbidities and functionality of CSBD, can be used to derive an integrated model for assessment and treatment approaches, which include cognitive behavioural therapy, other psychotherapies and medications such as selective serotonin reuptake inhibitors or naltrexone.
- Therapy addresses the balance between sexual self-control and excitation as well as underlying motivation and functionality with both psychosocial and drug-related approaches in three stages depending on the urgency and severity of the underlying mental health problems.
- In the future, examining certain subgroups of patients with CSBD, such as those with personality disorders, will be especially valuable, but, above all, therapeutic approaches must be studied in further randomized controlled trials.

qualitative deviations in sexuality[6]. The terms 'satyriasis' and 'nymphomania', which originate in Greek mythology, testify to the fact that even in ancient times people were preoccupied with a supposedly increased sexual drive or out-of-control sexual behaviour. However, the medicalization of such behaviour is likely to have taken place in the nineteenth century. In Europe, this situation was influenced in particular by the many editions of Krafft-Ebing's *Psychopathia Sexualis*, first published in 1886 (REF.[7]). In the tradition of that age, Krafft-Ebing illustrated and catalogued conspicuous features on the basis of case studies and named them in the same way that a biologist catalogues species, creating a series of disease patterns that remain influential, but also controversial, to this day. *Psychopathia Sexualis* marks the social transition at which point lawyers and physicians began to consider sexuality in relation to the classification of criminal behaviour as pathological or, above all, as malicious[6].

In 2020, the discussion regarding the difference between not being able or not wanting to control sexual behaviour remains. Importantly, Krafft-Ebing's concepts were oriented towards forensic material and, therefore, in the European tradition at least, the conception of CSBD is built on this basis. Krafft-Ebing collected qualitative deviations, which today are categorized as paraphilias, under the term "paraesthesia" — for example, sadism, masochism, and paedophilia. He contrasted hypoactive sexual desire ("anaesthesia") with "hyperaesthesia" — excessive sexual desire. Some of these fundamental principles still bear many similarities to those used today, for example, the conception of hypersexual disorder as a counterpart to hypoactive sexual desire disorder or the demarcation between paraphilic and non-paraphilic hypersexual disorders[4].

The destruction of Magnus Hirschfeld's Institute for Sexual Science by the National Socialists in 1933 had caused sexual science in Germany to fall into disuse until the 1950s, when the German Society for Sex Research was founded by Hans Giese, who was later the first director of the Institute for Sex Research at the University Medical Centre in Hamburg, Germany[8]. Giese developed guidelines in which sexual addiction was used as a leading symptom of disease for both paraphilic and non-paraphilic excessive sexual behaviour[9]. To give an example, the guidelines for sexual addiction Giese described included an increase in frequency accompanied by a decrease in satisfaction, a self-description of feeling compulsively addicted and periodic restlessness[9]. These guidelines were central in the development of German sexual criminal law for legal considerations of diminished culpability[10]. German law is still based on these principles and, under certain circumstances, contributes to the far-reaching decision of whether a person who has committed a sexual offence of a certain severity is placed in a forensic psychiatric hospital or in prison[10].

Development of the sexual addiction concept in the USA

Initially, the North American tradition of managing CSB was strongly rooted in the self-help system of the so-called 12-step groups[10] and, therefore, in the field of addiction. The 12-step programme was originally developed for alcohol abuse in the 1930s by Bill Wilson and was later adapted for other addiction programmes, including Sex Addicts Anonymous in 1977 (REF.[11]) (BOX 1). A treatment programme suggested as recently as 2018 also uses a 12-step approach[12].

The 12-step approach considers spiritual and religious influences in the evaluation of sexual behaviour and the resulting options for interventions and therapy[12], which might increase feelings of addiction to pornography as a function of moral incongruence between pornography-related beliefs and pornography-related behaviours[13]. Another concern with a such programmes is their basis in belief in a higher power, which might limit some patients' own ability and self-efficacy. A third problem of using an addiction model in this context is the question of abstinence, which in connection with the religious connotations of the 12-step approach could become associated with celibacy, and this might also increase moral incongruence[14]. These issues help to explain why the first efforts at conceptualization of compulsive sexual behaviour were met with criticism, which characterized the creation of a new disorder myth as a dangerous over-regulation or medicalization[15].

At the same time, a debate began about an aetiological, psychopathological and nomenclatural classification, which was co-determined by at least three further debates: one about CSB, sexual risk behaviour in connection with sexually transmitted infections (STIs) and more specifically HIV infections[16]; a second about the significance of sexual traumatization for CSB[17]; and finally, a third about so-called behaviour addictions[18–21]. Diversification in the study and treatment of CSBD in turn led to further development of individual focuses that were quite independent. Although Kafka's description of the disorder in 2002 (REF.[22]) initially tried to describe the disorder as descriptive and as free of aetiological assumptions as possible, he made a comparatively contrary proposal for the DSM-5 (REF.[4]), in which he tried

Box 1 | **The 12-step programme for Sex Addicts Anonymous**[11]

1. We admitted we were powerless over addictive sexual behaviour that our lives had become unmanageable.
2. Came to believe that a Power greater than ourselves could restore us to sanity.
3. Made a decision to turn our will and our lives over to the care of God as we understood God.
4. Made a searching and fearless moral inventory of ourselves.
5. Admitted to God, to ourselves, and to another human being the exact nature of our wrongs.
6. Were entirely ready to have God remove all these defects of character.
7. Humbly asked God to remove our shortcomings.
8. Made a list of all persons we had harmed and became willing to make amends to them all.
9. Made direct amends to such people wherever possible, except when to do so would injure them or others.
10. Continued to take personal inventory and, when we were wrong, promptly admitted it.
11. Sought through prayer and meditation to improve our conscious contact with God as we understood God, praying only for knowledge of God's will for us and the power to carry that out.
12. Having had a spiritual awakening as the result of these Steps, we tried to carry this message to other sex addicts and to practice these principles in our lives.

Reprinted from The twelve steps (SAA), International Service Organization of Sex Addicts Anonymous, Inc.

to include and reconcile the different concepts as broadly as possible (BOX 2). However, hypersexual disorder was not ultimately included in the DSM-5 (REF.[23]) because the Board of Trustees of the American Psychiatric Association argued that there was insufficient scientific evidence that the proposed criteria represented a distinct clinical syndrome and that it could potentially become a misused diagnosis in forensic settings[23].

CSBD in criminal law

The place of CSBD in law in Germany (as part of Europe) and the USA (as part of North America) are considerably different, and the legal systems themselves differ. The description of the legal situation in Germany reflects the professional experience of the author. No known work has presented and compared the very different legal systems in Europe or North America in terms of CSBD.

Criminal law in Germany

Conceptually, the degree to which a particular offence is considered socially or ethically reprehensible arises out of the concept of free will. This idea is central to the principle of culpability that dominates the German criminal code. The ability of an offender to comprehend the unlawfulness of the offence or to act according to this conceptualization might be seriously limited by a paraphilic disorder with an addictive and/or compulsive progressive course[10]. When evidence suggests the presence of a paraphilic disorder during commission of the offence, German judges must examine, with the help of an expert, whether and to what extent the paraphilic disorder was present and whether it seriously reduced the defendant's ability to control themselves. To address this legal question, the trial judge examines the diagnoses presented by the expert as well as the degree of severity of the disorder and its intrinsic relationship to the offence. In German legal contexts, expert witnesses are individuals who can provide information or evaluate a given situation on the basis of particular professional knowledge concerning facts, perceptions or common experience. In relation to paraphilic disorders, these experts are usually psychiatrists and experts in sexual sciences or sexual medicine. The expert witness is required to use the diagnostic and statistical classification system that is the official national standard, which is the ICD for Germany[10].

Criminal law in the USA

The author is not aware of any cases in which hypersexual or compulsive sexual behaviour have been used as a diminished capacity defence in legal proceedings in the USA. In the past, defence traditionally consisted of a cognitive test to assess their rationality at the time of the crime and a control test to assess volition. However, for the purposes of federal criminal law, the US Congress abolished the control test in 1984 (REF.[19]), leaving the insanity defence available only to defendants who substantially lack rational capacity, that is, those who do not realize the wrongfulness of their behaviour because of psychosis. However, the Federal Sentencing Guidelines of the USA authorize sentencing on the basis of "a significantly impaired ability to (A) understand the wrongfulness of the behaviour comprising the offense or to exercise the power of reason; or (B) control behaviour that the defendant knows is wrongful"[24]. Thus, a reduction in federal sentencing might be available to defendants who understood the wrongfulness of their actions but were unable to control their behaviour. Kleptomania and gambling disorder, but not CSBD, have been successfully used to mitigate criminal responsibility in cases where the defendant has clinically significant distress or impairment related to their disorder[19]. Compulsive sexual behaviour and hypersexual behaviour are also regularly used in civil commitment proceedings in the USA as validated risk factors for reoffending[25].

Diagnosis of CSBD in the ICD-11

Even though occasionally claimed otherwise, the ICD-10 already included the category of "excessive sexual drive", which — interestingly — had previously been included in the chapter on sexual dysfunction[26]. The diagnostic guidelines for CSBD in the ICD-11 (REFS[8,9]) are, therefore, a further development rather than an absolute novelty. In the current ICD-11 guidelines, rather than being categorized in the chapter on sexual dysfunction, CSBD is now listed in the subcategory of impulse control disorders[27,28], which is located in chapter 6 on mental, behavioural or neurodevelopmental disorders, alongside paraphilic disorders, whereas sexual dysfunctions are located in chapter 17, which covers conditions related to sexual health. Although the decision not to include CSBD in a sexuality-related section of the ICD-11 could be criticized by specialists in sexual medicine, it was not made without considerable reflection during the scientifically based weighting process[1]. From the point of view of a physician specialized in sexual medicine and sex therapy, not locating the disorder in an area that is specifically reserved for sexuality is associated with certain risks, such as neglecting the specific characteristics

Box 2 | **Proposed DSM-5 diagnostic criteria for hypersexual disorder**[4]

A. Over a period of at least 6 months, recurrent and intense sexual fantasies, sexual urges and sexual behaviour in association with three or more of the following five criteria:

1. Time consumed by sexual fantasies, urges or behaviours repetitively interferes with other important (non-sexual) goals, activities and obligations
2. Repetitively engaging in sexual fantasies, urges and behaviour in response to dysphoric mood states (for example, anxiety, depression, boredom and irritability)
3. Repetitively engaging in sexual fantasies, urges and behaviour in response to stressful life events
4. Repetitive but unsuccessful efforts to control or significantly reduce these sexual fantasies, urges and behaviour
5. Repetitively engaging in sexual behaviour 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 or behaviours.

C. These sexual fantasies, urges or behaviours are not due to direct physiological effects of exogenous substances (for example, drugs of abuse or medications)

Specify if: masturbation, pornography, sexual behaviour with consenting adults, cybersex, telephone sex, strip clubs, other.

Adapted from REF.[4], Springer Nature Limited.

associated with sexuality-related problems (for example, shame in speaking about sexuality). However, the distress and connection with other psychiatric disorders is so substantial in many patients whose placement outside chapter 06 (mental, behavioural or neurodevelopmental disorders) would be even more problematic.

Based on current evidence, rather than a category of behavioural addictions, as is the case in the DSM-5, the ICD-11 includes a category of impulse control disorders, which includes pathological gambling, kleptomania, pyromania and CSBD. Until now, the disorders categorized as behavioural addictions (as in the DSM-5) have not been based on clear scientific data[20,29,30]. The differentiation of CSBD from behavioural addictions also facilitates its differentiation from substance-related disorders. Instead, placement of CSBD in the ICD-11 chapter on impulse control disorders emphasizes the importance of repetitive behaviour and sexual self-control. Thus, in the ICD-11, CSBD is no longer categorized with sexual dysfunctions as the opposite of hypoactive sexual desire disorder, as it was in the ICD-10 (REF.[27]), and is also more distinct from paraphilic disorders than in the early proposals of Kafka[22], who first conceptualized CSBD as a "paraphilia-related disorder".

In the update for ICD-11 (BOX 3), the reference to Sigmund Freud's drive concept or high sexual desire[31] that the ICD-10 diagnosis used was abandoned, as was the reference to antiquated and moralizing concepts such as satyriasis and nymphomania. Nor was any attempt made to include the various aetiological or motivational causes of the disorder in the criteria, as had been proposed for the DSM-5 (REF.[4]) (BOX 2). Importantly, at their core, the criteria describe the relationship between sexual distress or sexual impulses and the ability to control oneself sexually. Without this being specifically named in any way, this description reflects one of the most important theories in clinical sexual science — the Dual Control Model[32,33]. However, temporal persistence and negative consequences have to be part of the clinical picture in order for it to be categorized as a disorder[2]. Furthermore, the negative consequences should not be due to moral or religious attitudes that are hostile to sexuality, as such attitudes cannot be the basis of a psychiatric disorder[2].

Hypersexuality
Level of sex drive, the frequency of sexual activity and/or the need to have sex frequently.

Epidemiology

Taking into account the different concepts of hypersexuality and CSB, an estimated prevalence of 3–5% in the general population has been reported[2,34]. However, these estimates did not include precisely defined disorder criteria, adapted instruments for measuring the constructs or representative samples. These estimates referred to a finding recurring in sex survey research since Alfred F. Kinsey's work[35,36]. In Kinsey's study, 7.6% of the men had a "total sexual outlet" (quantified by considering the total number of orgasms per week[34], irrespective of the way these orgasms were achieved and of any clinically relevant consequences) of >7 per week. Later, a total sexual outlet of this level was used as an indicator of hypersexuality[34,37]. Despite this important finding, it led to an overestimation of purely quantitative characteristics of hypersexuality or CSB.

In the context of prevalence estimates, the distinction between representative population samples and clinical and forensic samples is important because normally in clinical and samples of sex offenders, the prevalence is much higher than in the general population[38]. Finally, whether both men and women were included in the studies is important because the prevalence differs and is generally higher in men than in women[39,40].

A study by Langström and Hanson[41] can be regarded as an important milestone. Although their chosen construct for hypersexuality was based on statistical deviation from the norm and not on psychological distress or clinically relevant impairment, their approach was methodologically sound. Langström and Hanson used 'impersonal sexual behaviours', such as masturbation, pornography use, number of sex partners in last year, number of sex partners per active year, ever having sex with another person while married and/or cohabiting, currently having more than one stable sex partner, attitudes supportive of casual sex and group sex, and set the cut-off for defining hypersexuality at ≥3 indicators in order to identify as accurately as possible those patients above the 90th percentile for each gender (12.1% male; 7% female). Furthermore, their sample was representative, large ($n = 2{,}450$) and included both men and women. Their study enabled conclusions to be drawn about clinically relevant correlates of hypersexuality such as STIs, dissatisfaction in life and paraphilic interests. The association between hypersexuality and paraphilic sexual interests (exhibitionism, voyeurism, masochism and/or sadism) was particularly and equally strong for both genders (OR 4.6–25.6). One weakness of the study is certainly that the two central criteria for CSBD — a lack of sexual self-control and distress or impairment — were not measured. Thus, the associations identified between hypersexuality and other clinical parameters should not be confused with those of a clinical disorder such as CSBD.

Sexual compulsivity
Perceived lack of control over sexual behaviour and the perception that sexual behaviour is driven.

To date, the majority of research and the diagnostic criteria derived from this research are based on studies with predominantly male samples, whereas comparatively little research has been performed on CSB in women[42–44]. Representative studies show that gender differences are less pronounced than previously assumed and suggest a ratio of 2–3 men with CSB to every 1 woman[39]. In a 2019 study, 11% of men and 3% of women in the USA considered themselves to have a problem with pornography[45], and a 2018 US study reported that the relatively high proportion of 10.3% of men and 7.0% of women met the criteria for clinically relevant sexually compulsive behaviour[40]. The study authors questioned whether pop culture has correctly assumed that CSB is an epidemic and pragmatically responded that the individuals who meet the clinical cut-off point might actually capture the entire spectrum of CSB, ranging from problematic but non-clinical out-of-control sexual behaviour to the clinical diagnosis of CSBD. One can reasonably assume that the clinically relevant levels of distress and impairment associated with difficulty in controlling one's sexual feelings, urges and behaviours might represent both a sociocultural problem and a clinical disorder.

Aetiology

CSBD, like many other sexual or mental disorders, is probably an umbrella term or construct[46] that unites various different forms of CSBD; thus, many different causes and correlates are likely to be involved in its aetiology. The construct has not been reliably defined across different studies; thus, reproducibility of data cannot be expected unless the same construct is reused in a comparable study population. Thus, presenting consistent empirical research results for the aetiology of CSBD in order to go beyond the speculative and overgeneralized conclusion that the causes of CSBD are biopsychosocial is still difficult.

Physiological causes

In the disorder constructs of CSBD, aspects of obsessive-compulsive disorder spectrums[47], impulse control disorders[42] or behavioural addictions[20] are emphasized. A 2019 study found that compulsivity and, more strongly, impulsivity are both related to out-of-control sexual behaviours[48]. The lack of sexual self-control, the amount of time individuals report spending doing the behaviour and the negative consequences are central to all constructs. Some studies[18,38] suggest an interaction between negative reinforcement (anxiety reduction) and positive reinforcement (gratification through excitation and orgasm), which might be related to imbalances in different neurotransmitters, especially the dopaminergic and serotonergic systems[49].

Relatively little is known about the biological or physiological causes of CSBD. In their 2016 review, Kühn and Gallinat[50] conclude that alterations in the frontal lobe, amygdala, hippocampus, hypothalamus, septum and brain regions that process reward have a prominent role and that genetics studies and neuropharmacological treatment approaches suggest the involvement of the dopaminergic system. This summary illustrates how unspecific current knowledge is in this area but also provides a connection with other disorders, such as frontal lobe injuries, in which CSB is a symptom.

In 2017, Jokinen et al.[51] showed that epigenetic changes (in this case, reduced levels of methylation) in the corticotropin-releasing hormone gene region were related to hypersexual behaviour. A separate study from the same group suggests that the hypothalamo–pituitary–adrenal axis is dysregulated in men with hypersexual disorder[52]. This dysregulation — indicating a stress response — might correspond to the observed link between sexual abuse and other traumatic experiences such as psychological abuse[53] and the aetiology of CSBD. This finding also has implications for therapy as it shows that the clinical significance of traumatic events in CSBD, which has been repeatedly shown, also has a biological correlation. In a study of 67 patients with CSBD[54], plasma luteinizing hormone (LH) levels were significantly higher in patients with hypersexual disorder than in 39 healthy volunteers ($P = 0.035$). However, no significant differences in plasma testosterone were observed.

Psychosocial causes

At the psychological level, describing correlates is more justified than describing causes. Attachment problems have an important role as unspecific correlates in CSB aetiology and can be related to traumatic experiences[55–58]. In some people, sexuality is used as a strategy to self-medicate and to cope with negative emotions such as depression[22,59,60]. Past experiences of sexual abuse, although more often associated with sexual avoidance[61], can also be associated with sexual compulsivity[61]. Shame as a reaction to sexual behaviour often has a role in CSBD[43,62,63]. Shame can, in turn, be related to negative attitudes towards sexuality or

Box 3 | **ICD-11 diagnostic guidelines for compulsive sexual behaviour disorder**

"Impulse control disorders are characterized by the repeated failure to resist an impulse, drive, or urge to perform an act that is rewarding to the person, at least in the short-term, despite consequences such as longer-term harm either to the individual or to others, marked distress about the behaviour pattern, or significant impairment in personal, family, social, educational, occupational, or other important areas of functioning. Impulse Control Disorders involve a range of specific behaviours, including fire-setting, stealing, sexual behaviour, and explosive outbursts."

Reproduced from REF.[136], ICD-11 for Mortality and Morbidity Statistics, 4, WHO, Impulse control disorders, Copyright (2019).

"Compulsive sexual behaviour disorder is characterized by a persistent pattern of failure to control intense, repetitive sexual impulses or urges resulting in repetitive sexual behaviour. 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 behaviour; and continued repetitive sexual behaviour 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 behaviour 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 behaviours is not sufficient to meet this requirement."

Reproduced from REF.[137], ICD-11 for Mortality and Morbidity Statistics, 4, WHO, Compulsive sexual behaviour disorder, Copyright (2019).

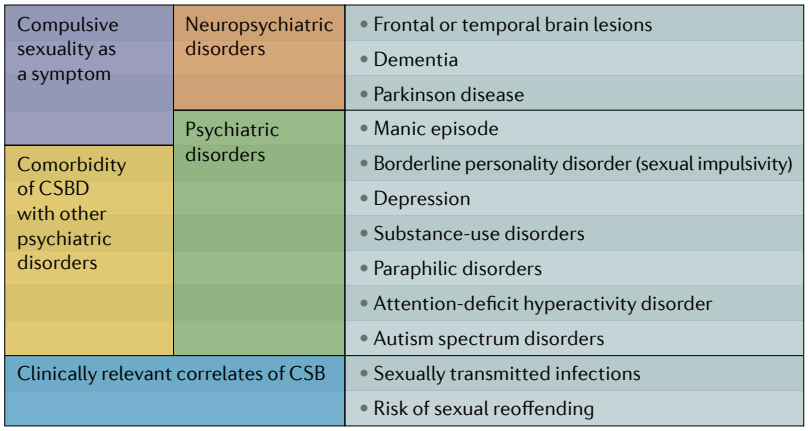

Fig. 1 | **CSBD versus disorders with compulsive sexual behaviour as a symptom.** Compulsive sexuality can be a symptom (violet, left column) of other disorders, including neuropsychiatric disorders (orange), such as in frontal brain syndromes, and psychiatric disorders (green), such as in mania. In these cases, compulsive sexual behaviour disorder (CSBD) would not be diagnosed. Some comorbid psychiatric disorders (yellow and green) are particularly important (right column — for example, borderline personality disorder, depression). Compulsive sexual behaviour (CSB) also has a number of important clinical correlates (bottom lines (blue)), such as sexually transmitted infections or the risk of sexual reoffences.

pornography consumption, some of which might also be religiously motivated[45,64]. This effect can also enhance moral incongruence and be associated with a propensity for CSBD[13,45,65].

Negative attitudes towards sexuality or pornography consumption are also clearly related to social factors. In particular, the attitudes towards sexuality in the society concerned and the expectations in terms of gender role of the patient (and, therefore, expectations regarding the social and gender-dependent construct of the CSBD diagnosis)[66] constantly change. Digital media[3] and the associated availability of pornography[29], as well as factors such as religiousness and moral disapproval of pornography use[45], also influence the development of CSBD at a societal level.

A multifactorial approach

Aetiological factors within the umbrella construct[46] of CSBD are multifactorial. Thus, determining the optimal therapy for a patient requires development of a model that attempts to exclude certain less likely causes and makes others more probable, taking into account possible causes and comorbidities. For example, primarily using psychotherapy to treat a patient with frontal brain syndrome would not be successful; in a patient with mania, the acute mania should be treated first. If the psychological distress is mainly caused by moral or religious aversions to the excessive masturbation or pornography, I would refrain from diagnosing CSBD but would still provide sexual counselling. These scenarios emphasize the need to clarify relevant comorbidities.

Differentials, comorbidities and related conditions

It is useful, at least theoretically, to distinguish between comorbidities and disorders that can have hypersexual or compulsive sexual behaviour as a symptom (FIG. 1).

Compulsive sexuality as a symptom

Neuropsychiatric disorders, especially those affecting the frontal or temporal lobes — for example, lesions after traumatic brain injury[67] — can cause CSB, mainly via a disinhibition effect[67]. Use of some medications, such as L-dopa (used to treat Parkinson disease and dystonias)[68,69], and illicit drugs, such as methamphetamines[70,71] can also be accompanied by CSB via an increase in dopamine levels. CSB can also be a manifestation of manic episodes via drive increase and disinhibition[72]. However, all these conditions of CSB do not fulfil the criteria of CSBD. If CSB is a symptom of such disorders, no separate diagnosis of CSBD should be made.

CSBD, sexual dysfunctions and STIs. As is the case in other sexual disorders, a connection between CSBD and sexual dysfunction can be clinically significant[73]. Erectile dysfunction in partnered sex has been reported in combination with an excessive use of pornography[72]. This combination is most likely related to compulsive pornography consumption combined with frequent masturbation as a solo sexual activity without erectile dysfunction, coupled with a lack of erections in partnered sexual activities[73], and in clinical practice patients report a number of factors, including habituation to strong stimuli in pornography, avoidance of intimacy, shame and also physiological factors such as refractory time and pain. Nevertheless, the links between erectile dysfunction and CSBD are far from clear in the literature[74].

In patients who demonstrate risky sexual behaviour in connection with CSBD[75], particular attention should be paid to STIs and HIV as a possible consequence[76], which should be investigated accordingly and information offered on prevention.

Paraphilic disorders. CSBD and paraphilic disorders, such as sexual sadism or exhibitionistic disorder, share some characteristics but also have important differences. Both CSBD and paraphilic disorders are associated with intense and repetitive sexually arousing fantasies, urges and behaviours that are relatively time stable and cause distress or impairment[2,22,77,78]. However, CSBD is characterized by normophilic sexual fantasies and paraphilic disorder by paraphilic sexual fantasies, urges and behaviours. In the current ICD-11 guidelines[1,78], the term paraphilic is limited to those forms of sexuality that involve sexual arousal patterns that focus on non-consenting others or are associated with substantial distress or direct risk of injury or death[1,78]. Comorbidity of CSBD with paraphilic disorders is extremely important and overlap between these two disorders is common (depending on the sample, up to 30%)[22,77,79]. The two disorders influence one other and play a significant role in the clinical severity of each disorder, psychological distress to the patient and forensic risk[25,80]. Paraphilias such as paedophilia, sexual sadism and exhibitionism are known risk factors for sexual reoffending[25], particularly in connection with CSB[37,81] (FIG. 2). Whether paraphilia and CSB are also risk factors for new offenders — that is, if sexual offences or assaults against others have not yet occurred — is unclear[82]. The treatment of patients with paraphilia at risk of committing sexual offences follows specific principles

Frontal brain syndrome
A brain disorder that is usually caused by physical damage to the frontal lobe of the brain.

Normophilic
Mainstream and socially accepted sexual interests (for example, sexual interest in adults) as distinguished from paraphilic interests (for example, sexual interest in children).

and treatment guidelines[83,84] in which the risk of (re) offending determines the intensity of the treatment[83]. Clinical treatment of patients with paraphilic disorders should be reserved for specific, experienced facilities. More research is needed that examines the different relationships between risk of sexual offences, CSBD and paraphilic disorder by disorder and in clinical and non-clinical settings (that is, using representative samples of the general population or offender-based samples).

Other psychiatric disorders. Data showing a high comorbidity of CSBD with depression and/or dysthymia, anxiety and psychoactive substance abuse disorders are mostly consistent[85]. Although reduced libido is a typical symptom of depression, in some depressed people with CSBD the self-esteem-enhancing, initially arousing and then relaxing effect of sex seems to be dysregulated and dysfunctional[1,38,86,87]. Studies performed and summarized by Kafka[4] report that of 240 male outpatients, the typical man with CSBD but without paraphilic disorders had multiple lifetime psychiatric disorders, including any mood disorder (61–65%, especially dysthymic disorder), any psychoactive substance abuse (39–47%, especially alcohol abuse), any anxiety disorder (43–46%, especially social phobia), attention-deficit hyperactivity disorder (ADHD) (17–19%) and any impulse control disorder (7–17%). In a separate study, participants with CSBD were more likely to report alcohol dependence (16.2%), alcohol abuse (44%), major depressive disorder (39.7%), bulimia nervosa (5.9%), adjustment disorders (20.6%) and abuse of or dependence on other substances (mainly cannabis and cocaine; 22.1%) than participants without CSBD[88]. Depression and personality disorder (borderline[89,90], narcissistic, but also avoidant personalities) are also important in clinical settings of CSBD[4,90].

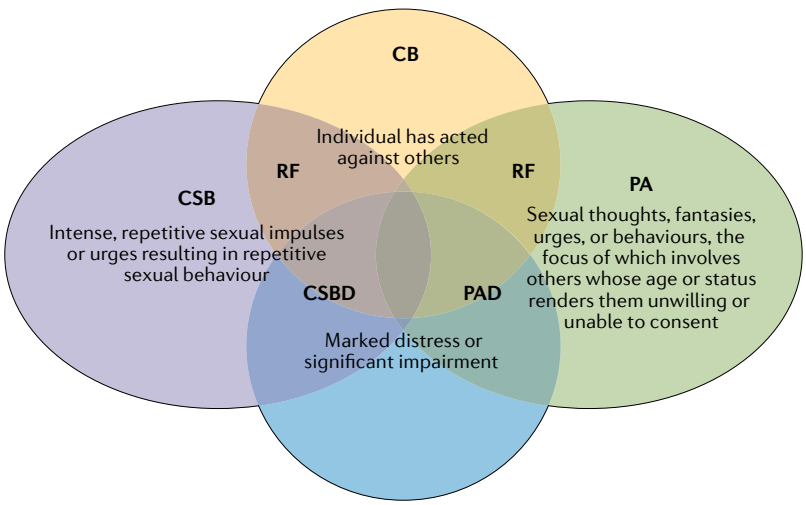

Fig. 2 | **Overlap between CSBD and paraphilic disorders.** Understanding the relationship between paraphilia and compulsive sexuality in terms of their associations with sexual delinquency and distress illustrates the difference between paraphilia and sexual offending behaviour. Not every sex offender meets the criteria for a paraphilia and vice versa. However, both paraphilia and compulsive sexual behaviour (CSB) are a risk factor for committing sexual reoffences. Besides the risk for others, distress is the central disorder criterion for both compulsive sexual behaviour disorder (CSBD) and paraphilic disorders. CB, criminal behaviour; PA, paraphilia; PAD, paraphilic disorder; RF, risk factor for sexual reoffending.

ADHD[22] and autism spectrum disorders[91] have also become the focus of studies on CSBD comorbidities. Assuming that sexuality, which is an important part of an individual's overall personality, can be a positive strategy for coping with depression and anxiety and a mechanism to enhance self-esteem, but can also be a negative means of self-injury, the way in which CSBD (for example, autoerotic behaviour such as solitary masturbation) can occur in comorbidity with many psychiatric disorders becomes clearer. All these disorders can influence an individual's capacity to relate to partners or their tendency towards a compulsive autoerotic sexuality[18].

The broad range of CSBD-related comorbidities illustrates the complexity of individualized diagnostics and treatment procedures, for which psychiatric–psychotherapeutic and sexual medicine expertise is necessary for management.

An integrated approach to understanding CSBD

The different aetiological aspects and comorbidities can be integrated with theoretical models — in particular, the Dual Control Model[32,33] and the Sexual Tipping Point Model[92,93], two of the best known clinical sexual science theories of the past 20 years — to make them applicable for diagnostic and therapeutic approaches in CSBD. These models are broadly studied and relatively easy to understand (FIG. 3); thus, they are useful concepts to use directly in communication with patients.

Models of sexual response

The Dual Control Model of human sexuality is based on the two antagonistic systems of sexual excitation and sexual inhibition[32,33,87]. These systems are conceptualized in terms of neurobiological and physiological systems (which have biopsychosocial development and maintenance processes relatively independently of each other), so that their balance or imbalance can explain sexual responsiveness and arousal. This model helps to understand both non-clinical and pathological forms of sexuality. Unlike the neurophysiologically independent systems of sexual excitation and inhibition used in the Dual Control Model, The Sexual Tipping Point Model attempts to understand human sexual excitability as the result of inhibitory versus arousing physiological, psychological and social variables[92]. The clarity of this model means that it is suitable for use with patients for psychoeducation. Both models describe sexual disorders against a background of relatively independent but interacting systems with excitatory and inhibitory effects, which correlate with biological factors (for example, hormonal and neurotransmitter functions), as well as with psychological factors (such as mood) and social factors (such as religion). Asserting that, in CSBD, the excitatory factors clearly outweigh the inhibitory factors or are dysregulated with regard to each other would be an oversimplification. Nevertheless, such a statement is a helpful starting point for a treatment model, as well as for explaining CSBD to patients, and is also scientifically based[32,33,87]. In my experience, very few patients come into treatment having had no or little sexual interest and low sexual responsiveness or sexual behaviour (autoerotic or with partners). Typically, sexuality has played

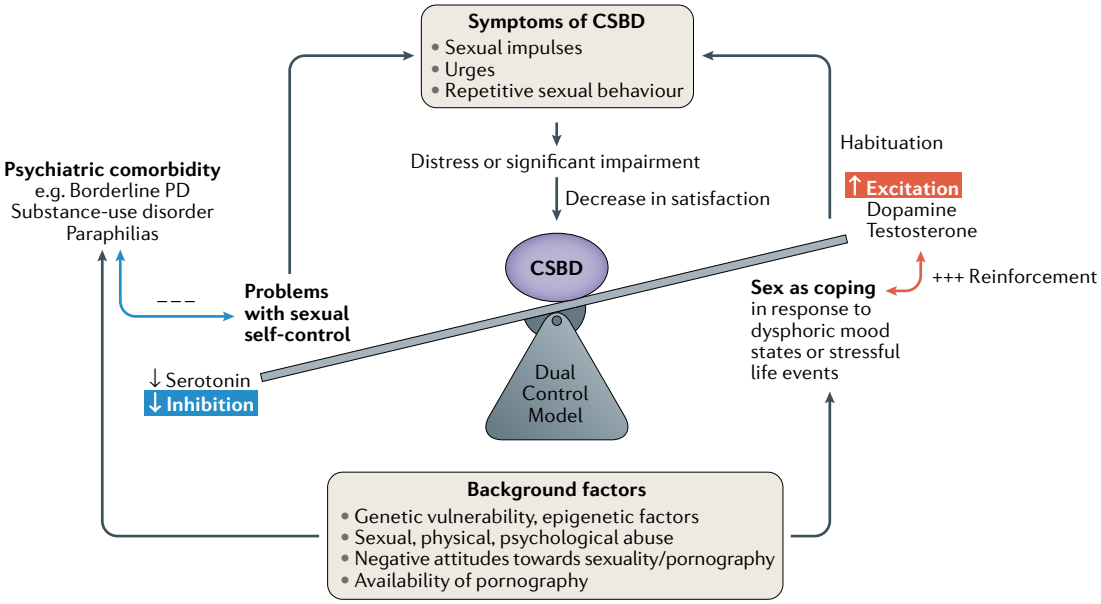

Fig. 3 | **An integrated model of CSBD based on the Dual Control Model and the Sexual Tipping Point Model.** In individuals with compulsive sexual behaviour disorder (CSBD), which can be based on various background factors, such as genetic factors, history of abuse or attitudes to sexuality, the interplay between excitatory and inhibitory inputs can be assumed to be in dysbalance. Dysbalances of the serotonergic system can be considered a biological correlate of a lack of inhibitory function, whereas excitatory functions might correlate with the dopaminergic system and testosterone. Comorbid psychiatric disorders (for example, borderline personality disorder) can be related to reduced sexual self-control (– – –). Increased excitation might be associated with an increased tendency to use sex as a coping strategy in response to negative mood or stress and is associated with negative reinforcement (+++). Habituation leads to an increase in sexual behaviour but a decrease in satisfaction. Increased and uncontrolled sexual behaviour associated with a decrease in satisfaction can be accompanied by distress and impairment. PD, personality disorder.

an important role over the course of a patient's life since puberty or even before. By contrast, problems with sexual self-control (which do not imply general self-control problems) have had a substantial effect on the lives of many people seeking treatment. Autoerotic behaviour, excessive pornography consumption or promiscuous sexual behaviour predominate and psychological distress and negative emotions are triggered by sexual fantasies and/or behaviours[59].

The Incentive Salience Theory framework, originally proposed by Robinson and Berridge[94], distinguishes two basic components of motivated behaviour: wanting and liking. Liking is directly linked to the experienced value of the reward — the unconditioned stimulus (UCS) — whereas wanting is related to the expected value of the reward, which is often prompted by a predictive cue (reward anticipation) — a conditioned stimulus (CS). Sex is a natural reward (with the UCS being orgasm) in which the anticipation of the reward reinforces the probability of occurrence. In the clinical setting, CSBD seems to have two bases: in some individuals, wanting seems to predominate, and in others their CSBD seems to be based more on liking. In the first case, for example, pornographic films are sought, viewed, saved, arranged and the 'ideal image' or film is searched for over many hours. This process is associated with sexual arousal and stimulation but orgasm is not the goal, or it might occur only once after many hours. By contrast, in people in whom 'liking' is dysregulated, sexual behaviour is often associated with orgasm, but orgasm is often not experienced as satisfying and relaxing. However, no empirical data are available to support a clear distinction between these two groups. Most of the laboratory-based studies only measure behavioural and neural reaction to erotic stimuli, which raises the question of what exactly is being measured: wanting or liking. Visual erotic content can be involved in both CS and UCS. Using terms from the Incentive Salience Theory, in which CS is a cue and UCS is a reward, sexual stimuli have both roles and can be an object of both wanting and liking[95]. Furthermore, if pornography becomes highly rewarding, then it can also be a subject of second-order conditioning and new initially neutral stimuli, such as being at a certain place or sitting in front of the computer, can become a highly triggering CS for the use of pornography[96–98].

In conditioning, an event that increases the probability that a certain behaviour will be shown is called reinforcement[96]. A distinction is made between positive reinforcement and negative reinforcement. Both have the effect that a behaviour is displayed more frequently, with the difference that in positive reinforcement a pleasant stimulus (such as orgasm) is added to a desired behaviour (having sex), whereas in negative reinforcement an unpleasant stimulus (such as depression or anxiety) is removed[99]. Detailed understanding and frequent re-evaluation of the interaction between positive and negative reinforcing aspects is important, because this interaction is subject to change in the course of diagnostics and therapy[38]. Therapeutic interventions for managing negative reinforcement (for example, treatment

for depression when CSBD is used as a coping strategy) use a different approach to the management of positive reinforcement.

Normal and different forms of pathological sexuality cannot be assumed to be based on fundamentally different biological mechanisms. Rather, one can assume that different forms of sexuality are based on more similarities than differences but that the ratio between factors (for example, excitatory and inhibitory) is dysregulated[87]. If hypersexuality and CSB are considered in this way[98], CSBD can be viewed as a clinically relevant turning point at which many clinicians would agree that a person who is distressed by CSB fulfils the criteria of a disorder.

Reward pathways and neural correlates

A meta-analysis by Noori et al.[100] investigated the degree to which drugs and natural rewards such as sex share neural substrates, in order to identify the common and distinct neural substrates of reactivity to drugs and natural rewards. Data showed largely overlapping neural response patterns for natural and drug rewards, observing bilateral neural responses within the anterior cingulate gyrus, insula, caudate head, inferior frontal gyrus, middle frontal gyrus and cerebellum[100]. Distinct activation patterns by drugs were found in the medial frontal gyrus, middle temporal gyrus, posterior cingulate gyrus, caudate body and putamen[100]. Natural (including sexual) reward cues induced unique activation of the pulvinar region of the thalamus[100]. A 2016 study by Banca and colleagues[101] reported an enhanced novelty preference for sexual images rather than control images in individuals who demonstrate CSB, possibly mediated by increased cingulate habituation as well as generalized enhancement of conditioning to rewards. Increased amygdala activation might reflect facilitated conditioning processes in patients with CSBD[96,102]. The existence of neuronal correlates of sexual behaviour, such as excessive pornography consumption[50], is clear but deriving causalities is not possible as longitudinal studies are lacking. However, that excessive use of pornography in vulnerable persons might lead to habituation accompanied by the downregulation of associated brain structures and functions seems possible and, if the person becomes accustomed to the excessive use of pornography or other sexual reward cues, this could lead to the search for increased or a more intense stimulation (for example, that shows more sexually violent acts). However, conversely, the neurobiological correlates might also be related to an increased vulnerability for an individual to increase their search for more stimulation, resulting in increased pornography consumption. Whichever is the case, neither clinical nor scientific evidence suggests that the regular use of pornography or high-frequency sexual behaviour in non-vulnerable groups is harmful per se or has negative consequences[103–105]. Vulnerable persons can be identified in the diagnostic process.

An integrated model for the assessment and treatment of CSBD

Overall, the individual blueprint for each person's sexual life is so diverse that simplifying models also have their limits — the imperfections and curiosity of humans lead to playful exploration and, therefore, to new experiences. Humans are specialists in being non-specialized. Thus, many different factors might correlate with being prone to developing CSBD, resulting in an integrated model that could also be useful in developing a therapeutic strategy for managing patients with the disorder (FIG. 3).

With the integrated model for assessment and treatment of CSBD, one can assume that, in individuals with CSBD, the interplay between excitatory and inhibitory factors is in dysbalance[33,87]. This dysbalance can be based on various background factors, such as genetics, history of abuse or attitudes to sexuality. Dysbalances of the serotonergic system can be considered as a biological correlate of lack of inhibitory functions[83,106], whereas excitatory functions might correlate with the dopaminergic system[50]. Testosterone is a prerequisite for sexual desire, responsiveness or excitation, especially in men, but the absolute level of testosterone does not seem to be elevated in individuals with CSBD[54]. Comorbid psychiatric disorders (for example, borderline personality disorder) can be related to reduced inhibition and to problems with sexual self-control[106]. Increased excitation might be associated with an increased tendency to use sex as a coping strategy in response to negative mood or stress and is associated with positive (pleasure, orgasm) but also negative reinforcement (negative mood improves through sexual activity)[38]. Habituation leads to an increase in sexual behaviour but a decrease in satisfaction[9]. Increased and uncontrolled sexual behaviour associated with decrease in satisfaction can be accompanied by distress and impairment. In this context, biological and psychological correlates are important, but social factors supporting negative attitudes towards pornography or hostile attitudes to sexuality also have a role[45].

Diagnostic process

Any patient referred with possible CSBD should have a thorough general, psychiatric and sexual history taken[38]. Taking a medical history of this kind requires experience, as shame or embarrassment on the part of both the patient and the therapist can create barriers that lead to the loss of important information. If evidence of organic causes of hypersexual symptoms exists, further investigation should also be carried out using laboratory tests (for example, serum testosterone, LH and prolactin levels) and/or neuroimaging. Causes can include medications, for example, L-Dopa[68,69], neuropsychiatric diseases, such as frontal brain syndrome[67] or Klüver–Bucy syndrome, genetic syndromes, for example, XYY syndrome[107,108], or hormonal abnormalities[52,54].

Many patients introduce themselves with a self-diagnosis of sex addiction. Caution should be exercised here, because this self-labelling does not always coincide with an actual diagnosis of CSBD and reinforcing it can be counterproductive. Notably, distress that is purely related to moral judgements and disapproval about sexual impulses, urges, or behaviours is not sufficient to meet the requirement for a diagnosis of CSBD[1,2]. In addition to the formal clarification of whether the diagnostic guidelines for CSBD are fulfilled, a number of questions regarding the individual's sexual experiences,

Klüver–Bucy syndrome
A brain disorder resulting from bilateral lesions of the medial temporal lobe of the brain.

Box 4 | **Questions for initial CSBD assessment**

- How strong has the intensity of sexual desire throughout life been? How pronounced are the sexual self-regulation abilities?
- What role do differences in sexual desire between partners play when a partnership exists? Has the person been sent to us from the partner?
- What role do moral and religious attitudes play (for example, towards pornography or extramarital sexual contacts)?
- What is the function of compulsive sexual behaviour disorder (CSBD) for the patient?
- Are positive (for example, stimulation) or negative reinforcement mechanisms (for example, coping with anxiety and depression) meaningful?
- What role do substance-related disorders and other mental disorders play? What about sexual risk behaviour and sexually transmitted infections?

roles and attitudes can be helpful additions to the initial diagnostic process (BOX 4).

This initial diagnostic process should also lead to a hypothesis about the integration of sexuality into the patient's overall personality and their ability to build stable relationships (not only sexual but also meaningful intimate relationships without sexual contact).

Assessment procedures

A number of developments have been made in the past 10 years regarding measuring instruments in this field, which is illustrated by the broad range of studies available on this topic[109]. However, differing interference constructs are still in use across such studies, which is reflected in the heterogeneity of the instruments they have produced. Turner et al.[110] in 2014 and Montgomery-Graham[109] in 2017, showed that the most researched self-rating measurements of hypersexual disorder or CSBD were the Hypersexual Disorder Screening Inventory, the Hypersexual Behaviour Inventory (HBI-19), the Sexual Compulsivity Scale, the Sexual Addiction Screening Test, the Sexual Addiction Screening Test-Revised and the Compulsive Sexual Behaviour Inventory. For a thorough patient assessment process a combination of one of these self-ratings (such as HBI-19) and external rating of the ICD-11 criteria should be used.

If the risk of committing sexual crimes in connection with CSB is a concern, this aspect can be assessed with the aid of standardized risk assessment instruments such as the STABLE-2007 (REF.[80]) or the Violence Risk Scale — Sexual Offender Version[111], in which sexual preoccupation or hypersexuality is generally one of the risk factors.

Treatment

The primary treatment goals for patients with CSBD are to enhance sexual self-control, to reduce problematic sexual behaviour, to reduce adverse consequences, especially the risk of harm to themselves or others, and to reduce distress and impairment in personal, family, social, educational, occupational or other important areas of functioning[38,112,113]. To reach these goals also requires targeting of correlating or mediating factors such as comorbid diagnoses (for example, depression or personality disorder) or specific symptoms, such as a craving for sex, reported by some of the patients[20].

In 2019, the first randomized controlled study of a cognitive behavioural approach to CSBD was reported[114,115]. Cognitive behavioural therapy (CBT) group treatment in this study consisted of seven modules carried out over a period of 7 weeks. The modules included psychoeducation (about the disorder itself), behavioural and functional analyses, and the teaching of certain techniques in handling problems associated with CSBD, such as urge surfing techniques, problem-solving techniques, assertiveness skills training and conflict management. Participants had to use text and visual material and do homework exercises. Participants in the treatment group demonstrated a significantly greater decrease in CSBD symptoms (Hypersexual Disorder: Current Assessment Scale (HD:CAS) score decreased from 9.1 to 5.5) than participants on the waiting list (HD:CAS 9.1 to 8.8) with a medium intergroup effect size at the post-treatment measurement ($P < 0.05$; Cohen's d 0.66; 95% CI 0.29–1.0). These effects remained stable 6 months after completion of therapy. In addition, participants in the treatment group also showed an improvement in depressive symptoms (Montgomery Åsberg Depression Rating Scale (MADRS-S) from 13 to 8.8; $P < .05$). Crosby and Twohig[116] compared a 12-session individual protocol of acceptance and commitment therapy (ACT) with a waitlist condition with no intervention in 28 men with problematic pornography use (although not with a known diagnosis of CSBD). Participants were randomly assigned to one of two conditions ($n = 14$ ACT, $n = 14$ waitlist). Results showed a significant reduction in pornography viewing in terms of hours per week spent watching in men receiving ACT compared with the waitlist group (93% reduction ACT versus 21% waitlist ($P = 0.018$)). When combining all participants ($N = 26$: $n = 13$ of the initial ACT group and $n = 13$ from the waitlist participants that later also received ACT), a 92% reduction in time spent viewing pornography was seen after treatment and an 86% reduction was maintained at a 3-month follow-up point. Complete cessation was seen in 54% of participants after treatment. At the 3-month follow-up assessment, 35% of participants showed complete cessation, with 74% of participants reporting at least a 70% reduction in viewing[116].

A 2015 review on the psychotherapy of CSBD stated that the hypothesized mechanisms by which certain treatment techniques could change hypersexual symptoms were mostly described in an unsatisfactory way in published studies[112]. Interventions targeted impairments in social, occupational or other important areas (such as leisure activities) of functioning, negative mood states, stressful life events and lack of behavioural control, but none of the reviewed studies included reported specific interventions for the risk of physical or emotional harm to self or others. The review concluded that the different aetiologies for and symptoms of CSBD should be approached using different psychosexual therapy and sexual medicine techniques.

In a separate review, Efrati and Gola[117] concluded that evidence exists for the use of mindfulness, CBT and 12-step approaches but did not give suggestions on what would be the best option in each situation. Therapeutic approaches in clinical settings are often more complex than those used for study purposes. Thus, clinical

Sexual preoccupation
Frequency of sexual thoughts, daydreams or dreams.

Cognitive behavioural therapy
(CBT). A form of psychotherapy that focuses on changing unhelpful thoughts and behaviours, improving emotional regulation and developing personal coping strategies.

Urge surfing
A technique that can be used to avoid acting on any behaviour that you want to reduce or stop by practicing mindfulness.

Acceptance and commitment therapy
(ACT). A form of psychotherapy that uses acceptance, mindfulness and behaviour-change strategies to increase psychological flexibility.

Mindfulness
Process of bringing one's attention to experiences occurring in the present moment without judgement.

Sex-positive
Positive attitudes towards sex.

experience and studies must be combined to shape these treatments into an integrated clinical approach usable for practical implementation. Coleman and colleagues[118] have suggested a sex-positive and integrated approach, based on theories that include family systems, social learning and attachment. Their protocol focuses on the individual's sexual and intimacy functioning and tries not to overpathologize sexual problems. Their psychotherapeutic approach focuses on understanding problems in intimacy development and works on developmental repair, positive self-identity and intimate relationships and also tries to resolve sociocultural conflicts with the individuals' values and erotic desires[98].

An alternative approach from Braun-Harvey and Vigorito[113] suggests a combined group and individual outpatient treatment that integrates best-practice clinical interventions, such as motivational interviewing, shame reduction, improvement of self- and attachment regulation, and facilitation of a positive sexual development within a sexual health framework, which requires sex to be consensual, non-exploitative, to prevent acquiring an STI, but also respecting the importance of sexual pleasure.

Ultimately, the severity of the disorder and the resources available determine which therapy can be used. The treatment goals and the development of a treatment plan vary but should consider the symptoms first and then the existing comorbidities and the underlying hypothesis for the development of the disorder. Thus, dividing the treatment goals and the treatment plan into different steps seems reasonable[38]. This enables the creation of an integrative model of CSBD treatment, based on the Dual Control Model and the Tipping Point Model (FIG. 4). The integrated model of CSBD therapy is aimed at bringing the imbalance between sexual inhibition and excitation into a more flexible balance. This balance can be achieved by improving sexual self-control. The changed understanding of one's own sexuality also makes it possible to use sexuality as a resource in a sex-positive way without having to forego sex completely.

First-step treatment goals

Many patients are initially very ambivalent about their problems and need information and motivational support. Identifying and defining treatment goals should be done together with the patient and they should be informed about CSBD, its different forms and correlates, and the therapeutic possibilities and strategies. Treatment goals in the first phase of therapy should be as realistic and achievable as possible in a short amount of time in order to minimize the risk of disappointment[38]. As with other disorders, concerns such as suicidal or self-injurious behaviour or risks to others take priority over all other therapeutic goals.

Sexual health education and enhancing self-control. Restricting access to certain stimuli can initially be a helpful and supportive step, especially in patients who use digital media for their sexual behaviour. Digital media, with their possibilities for making contact with others, easy availability of pornography and perceived anonymity, can be a particularly reinforcing trigger[38]. Restricting time spent online, switching to service providers that filter content, installing screening software or placing the computer in places that are visible to others can be concrete and helpful first steps[38]. A scale developed by Kraus and colleagues[119,120] is available to measure a patient's self-efficacy to avoid using pornography. With this Pornography-Use Avoidance Self-Efficacy Scale[120] (PASS) patients can indicate their current confidence that they could avoid using pornography on a scale from 0% ("not at all confident") to 100% ("completely confident") in situations such as being alone in the home, at the workplace, when feeling sexually excited or when feeling bored. Tools like this can help to identify patients at risk of relapse, who can then be supported by helping them to identify difficult situations, enhancing

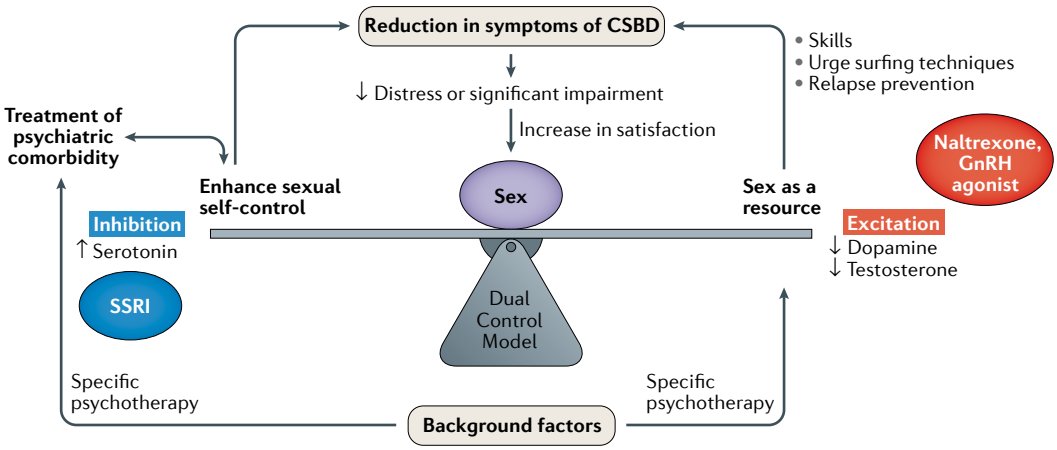

Fig. 4 | **An integrated model of CSBD therapy.** Drug treatment and psychotherapy can help to bring the imbalance between sexual inhibition and excitation into a more flexible balance. This can be achieved by improving sexual self-control (for example, by treating comorbid disorders but also by using selective serotonin reuptake inhibitors (SSRIs)). The changed understanding of one's own sexuality also makes it possible to use sexuality as a resource without having to forego sex. Naltrexone, and in cases of concomitant paraphilia, testosterone reduction with gonadotropin-releasing hormone (GnRH) agonists, can also be helpful. CSBD, compulsive sexual behaviour disorder.

self-control and developing coping strategies. Outpatient treatment is useful for most patients, as confrontation with problematic situations, triggers and unpleasant affects or moods associated with CSBD promote therapeutic work and reintegration of the patient into daily life. However, situations can also arise in which inpatient treatment becomes necessary, particularly if there is a threat of medical danger, such as suicide, if the patient demonstrates a risk for sexual offending that cannot be overcome, or if no living conditions can be created in which an improvement could be expected. If a substance dependency is present, this should be treated first.

Medication. The use of an affect-regulating medication can be a useful addition to motivating and supportive psychotherapeutic techniques, especially in the first phase of therapy[38]. After an initial series of case descriptions[49], retrospective and prospective open studies of medical interventions have begun in patients with paraphilic disorders and CSBD[106], and the first controlled study, which included 28 homosexual and bisexual men with CSB, was published in 2006 (REF.[121]). In this study, doses of 20–60 mg citalopram led to significant reductions in sexual desire ($P < 0.05$), frequency of masturbation ($P < 0.01$) and pornography use ($P < 0.05$). The benefits of selective serotonin reuptake inhibitors (SSRIs) in depressive disorders, anxiety disorders and obsessive-compulsive spectrum disorders have been confirmed in many controlled studies[122–124]. SSRIs, in particular, can delay ejaculation in men and orgasm in females and can also negatively influence erectile function and sexual desire, even in individuals without any hypersexual characteristics or CSBD[83,121]. SSRIs such as escitalopram or paroxetine[125] might, therefore, be helpful in treating CSBD-associated comorbid symptoms or disorders, especially taking into account that CSB can be a coping strategy with negative reinforcement for patients with other psychiatric conditions.

Naltrexone is an opioid antagonist that is used in impulse control disorders and in the treatment of substance use disorders and has also been used in patients with CSBD[126,127]. The mechanism of action of naltrexone, via endogenous opiate receptor blockade or inhibition of dopaminergic release in the nucleus accumbens, underlines the potential usefulness of using this medication in CSBD, especially in patients for whom a positive reinforcement mechanism is of particular importance and for patients with comorbid substance dependencies. However, this application of naltrexone has, thus far, only been reported in small case reports[126,127]. Thus, use of naltrexone for CSBD remains somewhat hypothetical at this point and will require controlled studies in the future.

Testosterone-lowering medications, such as gonadotropin-releasing hormone agonists, have been proposed for paraphilic disorders combined with CSBD[83]. No controlled study has investigated the use of testosterone-lowering medication in CSBD alone, and the possible adverse effects can make balancing the risk–benefit ratio challenging. Nevertheless, studies do suggest that testosterone withdrawal is an effective method of dampening sexuality as a whole. However, the scarcity of available data and known adverse effects of these agents (especially osteoporosis, metabolic syndrome, gynaecomastia and depression) mean that the use of testosterone-lowering medication should be limited to patients with a comorbid paraphilic disorder with a risk of sexual offending (for example, those patients also displaying paedophilic or sexual sadism disorder)[83,128,129]. From the clinical experience of the author, these agents can be useful in absolutely exceptional cases of particularly severe forms of CSBD without paraphilic disorders, when there is a serious risk of sexual offending, but only as a temporary therapy (for ~12 months). Nevertheless, they constitute an important therapeutic method in the patient group with comorbid paraphilic disorders.

Second-step therapy goals

The second stage of therapy should, like step 1, continue to consider the psychological and pharmacological treatment of comorbid disorders[38]. Second-step therapy particularly uses relapse prevention techniques, which initially help to identify and distinguish high-risk and less risky situations and to help the patient to avoid high-risk situations. Using a group setting provides the opportunity to build relationships with people experiencing similar problems and to learn about identification and confrontation processes. Aspects of shame and feelings of guilt are especially well managed first in individual but then also in a group therapy setting, as other patients can offer help, which can expand capacities for intimacy[113]. Typical situations or trigger factors (such as alcohol abuse or partner conflicts), special affective states or feelings (anxiety, depression or anger), risky thoughts and the resulting sexual behaviour should be identified, described and discussed regularly within the group or in an individual setting. The creation of protocols for the patient to follow or structured diaries can make this easier (FIG. 5). The goal of second-step therapy is twofold: first, to raise awareness and to identify early warning signs for high-risk situations for relapses; and second, to avoid risks and to develop alternative coping strategies or countering behaviours (for example, physical exercise). This approach is more successful than simply attempting to increase the patient's self-control[38,113]. Skill training, urge surfing techniques, mindfulness training, stress and anger management, conflict management, problem-solving techniques and relaxation techniques can all be helpful[114].

High-risk behaviours or relapses should be discussed in therapy as soon as possible and, if they do not involve sexual offending behaviour, should be seen as part of the disorder. Relapses should be seen as a regression into old coping strategies and lead not to resignation but to the development of new coping strategies. With the help of therapy, patients should develop a perspective of how undisturbed and fulfilled sexuality should look like for them personally, rather than solely focusing on their current problematic or pathological sexuality[38,113,118]. The preparation of a healthy sexuality plan can be helpful in this respect. A healthy sexuality plan is a written document that first describes the behaviours the patient wants to change, second the high-risk behaviours and

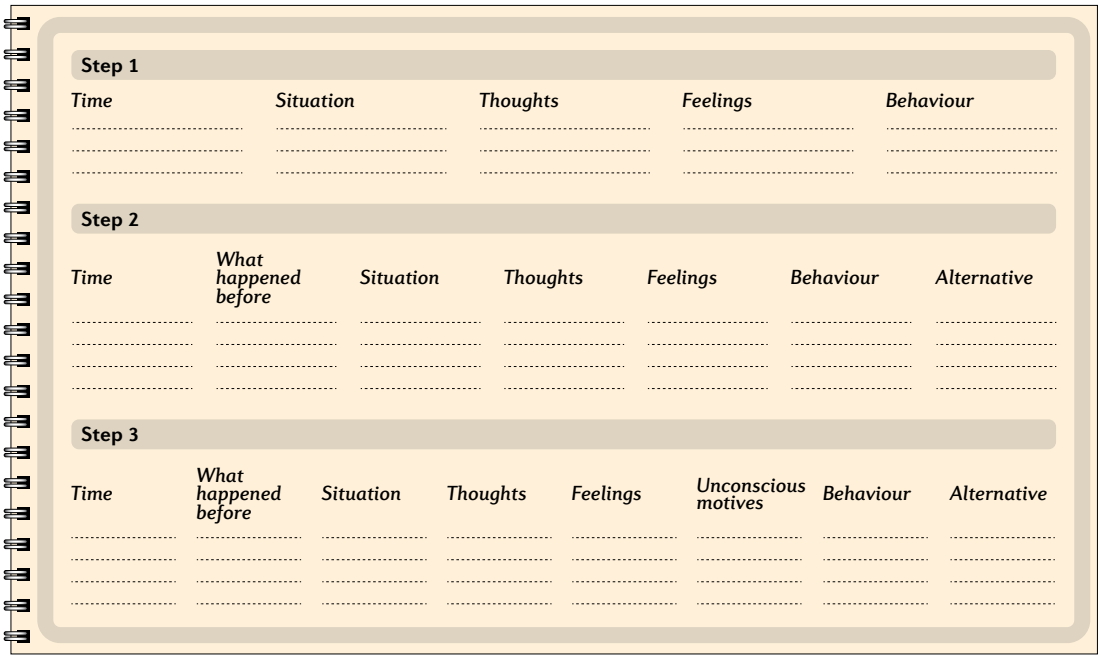

Fig. 5 | **Using structured diaries as an aid for patients.** Structured diaries help the patient to identify, describe and monitor situations, concomitant thoughts and the resulting sexual behaviour. This monitoring helps to raise self-awareness and to identify early warning signs for high-risk situations for relapses and also to avoid risks and to develop alternative coping strategies or countering behaviours. Diaries can also help to monitor initially unconscious motives of the sexual behaviour.

finally behaviours that are supportive for sexual health (for example, physical exercise or relaxation techniques)[113]. General lifestyle modifications, such as a balance between work and recreation, should also be considered.

From the clinical experience of the author, short-term psychotherapy and medication (steps 1 and 2) are sufficiently helpful in many patients, but, apart from the single randomized trial of CBT from Sweden[114], data are lacking.

Third-step therapy goals. If a CSBD exists simultaneously with a comorbid personality disorder, such as borderline or narcissistic personality disorder, treatment programmes specifically established for these personality disorders might have to be added to the patient's therapy plan. For borderline personality disorder, this treatment is most likely to be dialectical behaviour therapy[130] or transference-focused psychotherapy[130]. Dialectical behaviour therapy is a specific form of CBT that is aimed at providing the patient with new skills, overcoming painful emotions and reducing conflicts in relationships by using mindfulness[131,132], emergency tolerance techniques, emotion regulation strategies and interpersonal effectiveness to improve communication skills with others. In transference-focused psychotherapy, which is a form of psychodynamic psychotherapy, distorted perceptions of the self and others and related affects are at the centre of treatment as they arise in the relationship with the therapist (transference). If more traumatic experiences occur at this point during treatment, specific trauma-therapeutic techniques, such as Eye Movement Desensitization and Reprocessing, can be useful[133]. This phase of treatment focuses on the underlying affects, possible unconscious motives and also the long-term development of a therapeutic relationship[134]. Specific techniques for treating personality problems or disorders, as well as traumatic experiences, are often only possible when the symptoms have stabilized and the patient has developed enough confidence that their inner emptiness, loneliness, sadness, fear and shame can be tolerated and managed. This level of confidence requires a secure and sustainable therapeutic relationship to have formed to act as a basis from which to work through the patient's affects, defence mechanisms, transference and countertransference and conflict constellations, and to relate them to their sexual problems. If this — often lengthy — process is successful, it can lead to an improved integration of sexual experience and behaviour into the patient's overall personality[18,38].

Future directions

The process of establishing the diagnostic guidelines for CSBD for ICD-11 has led to an increase in research efforts in epidemiology, aetiology and therapy for the disorder. The quality of the new diagnostic criteria is now being tested in initial studies and will lead to further adaptations and improvements in diagnostic and assessment tools, especially those that measure the ICD-11 criteria.

The Compulsive Sexual Behaviour Disorder Scale (CSBDS) is currently developed[135] as a multi-language, short, validated and reliable measure for assessing CSBD. The CSBDS provides a cut-off score to identify individuals at high-risk of CSBD based on 19 items related to

Transference
The concept of transference stems from psychoanalysis and describes the process by which a person unconsciously transfers and reactivates old feelings, affects, desires and fears from childhood to new relationships — for example, to the psychotherapist.

Eye Movement Desensitization and Reprocessing
A psychotherapeutic treatment method for traumatized persons.

Conflict constellations
Conflicting internal demands within the subject.

five factors: control, salience, relapse, dissatisfaction and negative consequences.

Data are lacking regarding CSBD in women and individuals from ethnic and sexual minorities, as well as how CSBD varies based on cultural considerations. Future studies should focus on the disorder in these groups.

Within the framework of longitudinal studies, the influence of the use of digital media on the development of CSBD and its neurobiological, psychological and social correlates should be studied. However, one of the most important areas of study concerns the effectiveness of the many therapeutic approaches available, which have been evaluated clinically in case studies or small cohorts but only scarcely within the framework of randomized controlled studies.

Conclusions

CSBD is not a new phenomenon or a new diagnostic entity, but a problem described since the emergence of psychiatric–psychotherapeutic and sexual sciences. The evaluation of sexual activities is strongly dependent on social and, therefore, moral, religious or normative influences; thus, the resulting risk of overpathologizing sexual behaviour must be considered in diagnosis and therapy as well as in research. The new diagnostic guidelines of the ICD-11 address this problem directly.

Sexual fantasies and sexual behaviour arise based on the blueprint of an individual's personal development and on the interplay of motivational, excitation and inhibition factors. Excitation and inhibition are particularly well depicted by the Dual Control Model and CSBD can be described as an imbalance between excitatory and inhibitory factors, especially when sex used as a coping strategy for managing stressful emotional states gets out of control. This aspect explains the importance of psychiatric comorbidity in this group of patients and why it must be carefully diagnosed and considered during therapy. In addition to depressive disorders, comorbidity with paraphilic disorders is particularly important, especially when patients are at risk of committing sexual offences.

Therapeutically, a multimodal, step-wise approach must be used to bring in different treatment measures depending on the severity and acuteness of the disorder in order to prevent or contain the negative consequences of CSBD. Short-duration CBT group therapies have now been evaluated and experts have access to many years of clinical experience of treatment with SSRI and naltrexone. The integration of available research with the progress of creating diagnostic guidelines provides a model of assessment and treatment of CSBD, the relevance of which can be verified by clinicians and in future research.

Published online: 19 June 2020

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Acknowledgements
P.B. was consultant for the World Health Organization (WHO) regarding the development of the ICD-11 classification of sexual disorders and sexual health. The views expressed in this article are those of the author and do not represent the official policies or positions of the WHO.

Competing interests
The author declares no competing interests.

Peer review information
Nature Reviews Urology thanks M. Gola, S. Kraus and E. Coleman for their contribution to the peer review of this work.

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