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SEX AND ADDICTION (R REID, SECTION EDITOR)

Debating the Conceptualization of Sex as an Addictive Disorder

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Abstract Three predominant pathophysiological models have been applied to hypersexuality, which were developed based on observed similarities with obsessive-compulsive disorders, impulse-control disorders, and addictions. Each model was intended to elucidate etiological mechanisms and symptom profile, and facilitate effective treatment. Unfortunately, there are a number of conceptual problems inherent in these models, and clinicians and researchers have typically adopted one descriptive model and have applied it to all individuals presenting with hypersexuality. In this paper, I review the utility and applicability of the sexual addiction conceptualization, arguably the most common model used in both academia and popular media in describing this behavior. Emphasis is placed on the similarities and differences between hypersexuality and addictions, including clinical characteristics, neurobiological underpinnings, diagnostic co-morbidity, and treatment response.

Keywords Hypersexuality · Hypersexual disorder · Addiction · Sexual addiction

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Introduction

Hypersexuality has been described for some time [1–3] although sexological research has predominantly focused on disorders characterized by low levels of sexual desire and response rather than high levels of sexual behavior. Hypersexuality is defined as a "stronger than usual urge to have sexual activity" ([4], p823, [2, 3]) and is most often associated with the paraphilic disorders [5]. However, a number of researchers and clinicians have suggested that non-paraphilic hypersexuality can cluster with other relevant symptoms, such as loss of control over sexual behavior, the use of sex in response to dysphoric mood, and the continuation of the behavior despite adverse consequences, to represent a distinct psychopathological condition. Labels used in describing this putative construct include; Don Juanism, erotomania, nymphomania, paraphilia-related disorder, satyriasis, sexual compulsivity, sexual impulsivity, and most recently, hypersexual disorder.[1] Most of these terms are poorly defined and used interchangeably throughout the literature. In addition to such descriptive diversity, the field has been plagued by a number of other problems, such as a relative lack of empirical research as compared to clinical anecdote, inadequate sampling methods, as well as definitional and conceptual ambiguity [6, 7].

Conceptual problems were noted decades ago [8, 9], and there has been little progress made toward resolving such

[1] I use the term hypersexual disorder throughout this review except when referring to specific conceptual models (e.g., sexual addiction). Hypersexual disorder was the term used by the DSM-5 Sexual Disorders Work Group (also see Kafka, 2010). Some have criticized this term predominantly because some clients can present with clinically relevant symptomatology but not be engaging in statistically excessive sexual behavior.

issues. In this paper, I review the evidence for an addiction-based conceptualization of hypersexual disorder, probably the most widely adopted conceptual model in use today, and I focus specifically on the similarities and differences between hypersexual disorder and addictions, including shared clinical characteristics, neurobiological processes, co-morbidity, and responsiveness to treatment.

Conceptual Models of Hypersexuality Disorder

Considerable attention has been directed toward how best to conceptualize hypersexual disorder. There are three predominant pathophysiological models, which have been developed based on observed similarities between hypersexual disorder and obsessive-compulsive disorders (sexual compulsivity), impulse-control disorders (sexual impulsivity), and addictions (sexual addiction). Each model encompasses similar features, such as impaired behavioral self-regulation and the criterion for clinical significance; however, there are key differences with respect to underlying motivational states. That is, the extent to which the underlying behavior is driven by features of impulsivity or compulsivity.

Although often used interchangeably, impulsivity and compulsivity are relatively distinct constructs. Impulsivity is typically defined as a "tendency to act spontaneously and without deliberation" ([10] p313) and as a predisposition toward rapid, unplanned reactions to either internal or external stimuli without regard for negative consequences [11]. More recently, impulsivity is seen as a complex cluster of lower-order traits, including sensation-seeking, lack of planning, lack of perseverance, and positive and negative urgency [12]. Theoretical approaches toward understanding impulsivity have focused on a strong approach motivation combined with a weak avoidance motivation and underlying problems in self-regulation [13]. Compulsivity is also a complex phenomenon but, in contrast to impulsivity, is characterized by repetitive actions that are intended to reduce anxiety or distress [4]. Individuals with compulsive traits are typically hypervigilant, and they exhibit a desire to avoid harm and reduce anxiety. These traits have been embedded within most definitions of addiction.

Defining Addiction

Addiction describes a maladaptive pattern of substance use with impaired control and adverse consequences. According to the American Society of Addiction Medicine [14], addiction is characterized as a chronic disease involving brain reward mechanisms and related circuitry, along with other associated factors, such as problems with behavioral self-control and craving. In DSM-5, addiction[2] is characterized by a cluster of cognitive, behavioral, and physiological symptoms related to the continued use of the substance despite adverse consequences ([4], p483). Twelve criteria defining addiction are listed in the DSM-5 ([4], p483-484), which are grouped into four categories: impaired control (including diminished ability to resist cravings), social impairment, risky use, and pharmacological criteria (i.e., tolerance and withdrawal).

In addition to important diagnostics features, addiction has also been delineated by distinct phases [15]. That is, initial consumption of the substance is primarily motivated by impulsivity and principles of positive reinforcement (i.e., hedonically rewarding properties of the drug) toward compulsive traits and principles of negative reinforcement, which are associated with relieving dysphoric mood associated with abstinence and/or from adverse environmental experiences. This transition has been supported in experimental research (e.g., [16]).

The contemporary formulation of addiction is generally restricted to the problematic use of psychoactive substances; however, there is a trend toward categorizing certain behaviors under a singular model of addiction, often referred to as *behavioral addictions* or *process addictions* [17–19]. Several behavioral addictions have been proposed, such as compulsive buying [20], exercise addiction [21], and excessive tanning [22], and each are seen as virtually synonymous with substance addictions with the exception that a particular behavior replaces the alcohol or drug of choice [23]. Currently, only Gambling Disorder (formerly termed Pathological Gambling) has received enough empirical support to be officially reclassified as a non-substance-related disorder [4]. Internet Gaming Disorder [24] was included in the appendix of DSM-5 among the conditions in which future research is encouraged.

It should be noted that categorizing behaviors under a singular model of addiction has been challenged given the tendency for expansive models to oversimplify complex phenomena and to obscure key differences between disorders [17, 25]. Although broadening the concept of addiction promotes heuristic utility, some suggest decreased clinical utility, as it neglects to elucidate key mechanisms within particular disorders [26].

[2] The DSM-5's substance-related disorders workgroup selected the term *substance use disorder* as the official diagnostic label rather than addiction, as the latter term was seen as controversial, pejorative, and ambiguous. Nevertheless, the two terms are virtually synonymous.

Defining Sexual Addiction

As with other behavioral addictions, sexual addiction is conceptualized as being synonymous with substance use disorders. The notion that sexual behavior could be potentially addictive was first introduced by Orford [9], but it has become most widely attributed to Patrick Carnes' [27] book: *Out of the Shadows: Understanding Sexual Addiction*. Carnes described sexual addiction as representing a pathological relationship with a mood-altering experience ([27], p4), and he, along with others [28, 29] have identified shared clinical characteristics between non-paraphilic (as well as paraphilic) hypersexuality and addiction.

Clinical Characteristics

Similar to substance-related disorders, sexual addiction has been characterized by intense, frequent preoccupation with sex, loss of control in regulating sexual behavior, and an inability to stop despite adverse consequences. A number of studies with relatively small clinical samples have shown that a significant proportion of self-identified sexual addicts report recurrent and intense sexual urges that are difficult to control and have led to some form of adverse consequences or personal distress [30, 31]. Many of these reported characteristics are similar to those emphasized in standard definitions of addiction, such as the DSM [4]. Wines [32], for example, compared substance dependence criteria based on DSM-IV [33] with the self-reported symptoms of 53 self-identified sexual addicts attending 12-step programs for sexual addiction. Results demonstrated that each of the seven criteria listed in the DSM were endorsed by the majority of the clinical sample. More specifically, 87 % of the sample endorsed features associated with social impairment, 85 % experienced risky use, 94 % experienced impaired control, whereas 74 and 98 % experienced tolerance and withdrawal, respectively. The aforementioned studies investigating clinical characteristics, however, are limited due to the small sample sizes and are also likely influenced by an ascertainment bias, such that individuals experiencing such symptoms are likely to be present in selected treatment samples.

In addition to specific clinical characteristics, such as those reported in DSM-5, Koob [15] emphasized features of impulsivity and compulsivity. As noted earlier, addictive behavior has been characterized by the progression from impulsivity (i.e., using the substance for pleasure) to compulsivity (i.e., using the substance to escape from negative emotional states). The degree to which hypersexual patients exhibit compulsive versus impulsive traits have been specifically used to support the obsessive-compulsive [25, 34] and impulse-control disorder models [35, 36], respectively. However, the literature has failed to produce a consistent and unified phenomenological profile [7]. Indeed, it is clear that some individuals with hypersexuality exhibit compulsivity; that is, dysregulated sexuality to alleviate negative emotional states [30, 37], whereas others have found that individuals show impulsivity directed toward enhancing positive emotional states [36, 38–40]. In addition to comparisons across samples, such contradictions in motivational states have been indicated within samples. For example, Raymond et al. [37] indicated one third of participants in their sample found their thoughts to be intrusive and that 87 % attempted to resist such urges, which was evidence for compulsivity. However, mean scores on the impulsivity subscale of the Minnesota Personality Questionnaire [41] were indicative of higher levels of impulsivity when compared to normative samples.

In sum, these investigations suggest that both impulsive and compulsive traits can be evident in a sample of individuals presenting with hypersexual disorder. As such, an adequate conceptualization of hypersexual disorder must allow for the inclusion of impulsive and/or compulsive features. Interestingly, early descriptions of sexual addiction identified both compulsivity and impulsivity. Goodman [28], for example, stated that the function of excessive sexual behavior was both to produce pleasure and provide escape from pain, which highlighted the divergent motivations underlying such behavior. The progression from impulsivity to compulsivity, as described in some addiction models, may be evident among individuals exhibiting hypersexual disorder but research addressing this issue is needed. Alternatively, there is also the possibility that the progression is reversed; that is, individuals may engage in sexual behaviors to regulate negative mood and then, due to principles of reinforcement, engage in such activities to increase pleasure and positive mood states.

An integrated continuum including compulsive and impulsive features is not new nor is it specific to sexual addiction models; in fact, such a conceptualization has been described within the obsessive-compulsive spectrum disorders model (OCSDs; [42, 43]). The OCSD incorporates several disorders, placed along a continuum, based on perceived similarities with obsessive-compulsive disorders, such as symptom profile, etiology, family history, and treatment response. The continuum includes *pure* compulsive behaviors (e.g., body dysmorphic disorder) at the one extreme end of the spectrum and pure impulsive behaviors (e.g., pathological gambling) at the other end [44]. Within the OCSD model, hypersexual disorder is generally regarded as a disorder at the impulsive end of the spectrum [43], which is consistent with some studies suggesting a predominantly sensation-seeking motivational mechanism driving such behavior (e.g., [40, 45]) but is clearly inconsistent with other research (e.g., [25]). Additionally, several criticisms have been directed at the OCSD model, which have typically focused on whether the disorders have been adequately classified along the spectrum and the degree to which disorders share a similar treatment response [46].

However, despite the predominant focus of hypersexuality along the impulsive side of the spectrum, the OCSD model advances a useful concept in understanding the heterogeneous presentation of hypersexuality. That is, compulsivity and impulsivity may co-occur, either simultaneously or at different times, within a particular disorder [47, 48]. This hypothesis has received some empirical support, both with regard to behavioral disorders in general (e.g., eating disorders) and with hypersexual disorder, in particular.

Neurological Similarities

Similarities between neurological substrates of addiction and non-substance-related behaviors have been identified to support behavioral manifestations of addiction [49]. The neurobiological mechanisms of addiction have been largely determined from animal models and predominantly relate to certain brain circuits, particularly within the mesolimbic reward pathway, and neurochemical changes (e.g., dopaminergic and serotonergic dysregulation) occurring in these areas of the brain. Among the various behavioral addictions, research has predominantly supported the neurological similarities between substance use disorders and gambling disorder (see [23] for a review).

Although neurological processes underlying human sexual behavior are still relatively unexplored, it is generally acknowledged that neurotransmitters, particularly dopamine and serotonin, play a role in sexually appetitive behavior and that sexual arousal affects the mesolimbic dopamine pathway [50, 51]. In animal models, dopamine is one of the primary neurotransmitters involved in facilitating both the appetitive and consummatory phase of sexual functioning [52], and dopamine agonists have both facilitated and restored mounting behaviors, whereas dopamine antagonists decreased the number of mounts, intromissions, and ejaculations [53, 54].

Mesolimbic dopamine functioning has not been systematically examined among individuals with and without hypersexuality or hypersexual disorder. Much of the evidence for dopamine's role in hypersexuality has come from pharmacological interventions, and such research has been published in a number of case reports. There are several examples where increasing levels of dopamine in Parkinsonian patients have been associated with the emergence of both non-paraphilic and paraphilic hypersexuality (e.g., [55]) and that the reductions in dopamine levels have reduced hypersexual behavior [56].

Co-morbidity

The co-occurrence between hypersexual disorder and substance addictions has been posited as an important indicator of etiology and may be indicative that the disorders do not represent independent phenomena but rather, are different phenotypes of the same underlying disorder. Substance use disorders tend to be one of the most frequently co-occurring psychiatric disorders among individuals with hypersexual disorder [57, 58], but there have only been a few studies with nationally representative samples that have assessed the co-morbidity between hypersexuality and substance addictions. For example, Ramrakha et al. [59•] analyzed data collected on a nationally representative sample of 1037 men and women in New Zealand. Results indicated that the risk of substance dependence disorder increased with increasing numbers of sexual partners for both men and women. This study, however, did not directly assess hypersexual disorder, and the average number of sexual partners would not have met the behavioral criterion for this disorder. In a large, representative Swedish sample, Långström and Hanson [60] also found that hypersexuality was associated with heavy drinking and illicit drug use.

Several studies also report co-morbidity between hypersexual behavior and substance use disorders within clinically relevant samples. Carnes [61] surveyed 289 sexual addicts and found the majority of the participants experienced multiple addictions, and slightly less than half of the sample reported chemical dependency as their primary concurrent addiction. Black et al. [30] reported that the most common co-occurring disorder in the sample was a substance use disorder with 23 (64 %) of the sample experiencing both hypersexual disorder and a substance use disorder. Opitz, Tsytsarev, and Froh [62] reported substance abuse to be one of the significant factors associated with female hypersexual disorder, such that it accounted for 4 % of the variance of hypersexual disorder, next only to depression, which accounted for 28.5 % of the variance. In a larger clinical sample of 432 men and 193 women receiving services from a sexually transmitted infection clinic, Kalichman and Cain [58] found that higher scores on the sexual compulsivity scale [63] were strongly associated with greater use of substances within sexual contexts as well as higher scores on alcohol and drug abuse screening tests; the participants were also more likely to have abused cocaine and inhalants in the previous 3 months than individuals with lower scores on this measure. Most recently, Berberovic [57] found that substance abuse was also highly co-morbid with hypersexual disorder, as assessed using the sexual compulsivity scale, in a sample of students recruited from four large universities. Specifically, drug users were approximately 3.5 times more likely to be classified hypersexual than non-drug users. Significant correlations were also reported between hypersexuality and alcohol and cigarette addictions.

Data obtained from both representative and clinical samples suggest that the co-occurrence between substance addictions and hypersexual disorder is common and points to a common pathophysiology. However, it is not entirely clear

whether alcohol or drug use simply disinhibits hypersexual behavior. Additionally, although substance use disorders are one of the more frequently co-occurring disorders with hypersexual disorder, there are a number of other co-morbid conditions. Other psychiatric disorders, such as mood and anxiety disorders [64], attention-deficit hyperactivity disorder [65], as well as impulse-control disorders and the disorders previously referred to under the personality disorder section of earlier DSM texts [30] have been identified.

Responsiveness to Treatment

Treatment protocols used with substance-based addictions have largely informed interventions provided to individuals with hypersexual disorder. Unfortunately, there have been few high-quality outcome studies demonstrating the efficacy of these approaches. The non-pharmacological treatments used for both disorders are based on relapse prevention and utilize cognitive-behavioral techniques. Despite the limited data, the use of relapse prevention is the current treatment of choice for both substance-based addictions and hypersexual disorder [66], with some studies showing some promising results (see [67] for a review).

In addition, 12-step programs, which were initially designed for substance-based addictions, have been adapted and used to treat hypersexual disorder. Several researchers have criticized the utility of the 12-step approach for both substance-based addictions and other addictions [7, 68]. In particular, Coleman [25] and Keane [17] have suggested that problems identified within the 12-step treatment approach for hypersexual disorder are indicative of the inappropriate adaptation of the addiction model to hypersexual disorder. One of the significant concerns with the adapted 12-step approach for problematic hypersexuality is the notion of rejecting personal control. This perspective diametrically opposes empirically validated cognitive-behavioral treatment in general and specific models of rehabilitation, in particular, which emphasizes the notion of accepting the role of personal choice and responsibility and instituting greater insight into the role of cognitions and emotions in behavioral change.

In addition to psychological interventions, there are some pharmacological agents that are used in the treatment of substance addiction that have shown some promise in the treatment of hypersexual disorder, although well-designed experimentally controlled designs are lacking. Naltrexone, for example, is an opioid antagonist medication used for the treatment of alcohol use disorders and opioid addiction. Previous studies have supported its efficacy in the treatment of substance use disorders [69]. Raymond, Grant, Kim, and Coleman [70] reported on two cases reporting hypersexuality that were successfully treated with Naltrexone. Bostwick and Bucci [71] presented a case of a 24-year-old man requesting treatment for his sexual addiction. This individual reported a preoccupation with Internet pornography and was spending hours each day chatting online, masturbating, and meeting cyber contacts for spontaneous and unprotected sex. The patient was prescribed Sertraline as well as various types of psychosocial counseling with little improvement. After the addition of Naltrexone, the patient reported significant improvement in his ability to control his sexual behaviors. When the Naltrexone was discontinued, the cravings returned and when the medication was re-administered, the cravings again diminished.

Conclusion

Classification systems are intended to elucidate etiological mechanisms and symptom profile, and facilitate effective treatment. Unfortunately, several contradictory explanatory models have been used with hypersexual disorder, and clinicians and researchers have typically adopted one descriptive model and have applied it to all individuals presenting with this syndrome. Consequently, it is not surprising that there is a lack of consensus regarding definition and symptom presentation. In this paper, I reviewed the evidence for the addiction-based model of hypersexual disorder. A number of similarities between addictions and hypersexuality have been noted, including shared clinical characteristics, neurobiological profile, co-morbidity, and treatment response. However, in contrast to Gambling Disorder, research is insufficient to support the adoption and implementation of this model. The extant literature has shown substantial heterogeneity among individuals presenting with hypersexual disorder, both with respect to motivational drive states (i.e., impulsivity versus compulsivity) and in terms of symptom profile [72•]. Such heterogeneity has obvious implications for treatment.

A number of researchers have suggested that theoretically neutral terms and models be used in describing hypersexual disorder [6, 7, 51]. The sexual desire disorders model (see Kafka, [73]) and dual control model ([74], also see [75] for a review) are useful models as they are not bound to current explanatory mechanisms and consequently permit a range of etiological factors associated with hypersexuality. Importantly, theoretically neutral conceptual models and terminology allow for considerable flexibility in assessing motivational drive states that are important for the design and implementation of treatment for hypersexual disorder.

Compliance with Ethics Guidelines

Conflict of Interest Drew A. Kingston declares that he has no conflict of interest.

Human and Animal Rights and Informed Consent This article does not contain any studies with human or animal subjects performed by any of the authors.

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