

A Study of Comorbid Sexual Addiction in Male Patients with Substance Use Disorder: Review Article

Ibrahim S. Nayel *, Shorouk F. Abd-Elmaksoud, Waleed E. Elazab, Mohamed M. El-Hamady

Psychiatry Department, Faculty of Medicine, Benha University, Benha, Egypt.

*Corresponding Author: Ibrahim S. Nayel, Email: ibrahimnayel005@gmail.com, Phone: +201228818083

ABSTRACT

Background: Sexual addiction involves the inability to control one's sexual behaviour. The classification of excessive sexual behavior as an addiction, compulsion, or impulse control disorder remains debatable due to distinct etiological models and treatment approaches. Despite, causing significant emotional and behavioral issues, sexual addiction disorder has received limited attention from clinicians. Recent research highlights a bidirectional relationship between substance use disorder (SUD) and sexual addiction.

Objective: This review article aimed to examine the occurrence of sexual addiction in patients with substance use disorder. We hypothesized that patients with substance use disorder have a higher level of sexual addiction when compared to individuals not suffering from substance use disorder.

Methods: We searched Google Scholar, Science Direct, PubMed and other online databases for Comorbid sexual addiction, Male patients and substance use disorder. The authors also reviewed references from pertinent literature, however only the most recent or comprehensive studies from 2010 to February 2023 were included. Documents in languages other than English were disqualified due to lack of translation-related sources. Papers such as unpublished manuscripts, oral presentations, conference abstracts, and dissertations that were not part of larger scientific studies were excluded.

Conclusion: Controversies persist regarding the definition, diagnosis, and treatment of sexual addiction, despite its substantial impact on affected individuals. Although, limited current data support a correlation between SUD and sexual addiction, emphasizing the need for further comprehensive research to elucidate this relationship.

Keywords: Comorbid sexual addiction, Male patients, substance use disorder.

INTRODUCTION

Sexual addictive behaviours may include compulsive or excessive sexual drive/desire pornography use, masturbation, sexual video/chat use and engagement in sexual fantasy or sexual intercourse. Nearly 31% of men suffering from substance use disorder (SUD) are at risk of sexual addiction disorder [1]. SUD is defined as having significant psychological, biological, or sociological problems and while persistently contributing to the use of the substance responsible for these problems. By this model, the patient does not have problems in all three areas, or even two, to be considered substance dependent [2].

The American Society of Addiction Medicine (ASAM) changed their concept about definition of addiction to include both substances and behaviors. Many evidences come to uncover the overlap between both behavioral and substance addictions in terms of clinical expression (e.g. craving, tolerance, and withdrawal symptoms), neuro-biological profile, comorbidity, heritability, and treatment. Furthermore, both behavioral and substance addictions share several characteristics in natural history, phenomenology, and adverse consequences. Such addictive behaviors may include gambling, Internet use, video game playing, shopping, kleptomania, and sexual addiction [3].

Sexual addiction is a condition distinguished by intrusive and repetitive sexual thoughts and fantasies, excessive sexual behaviours, and a lack of control over one's own sexual desire. This leads to distress and impairment in one's relationships and social life. Despite, being proposed as a distinct condition in the

most recent edition of the diagnostic and statistical manual of mental disorders (Fifth edition), sexual addiction disorder or hypersexuality disorder was ultimately excluded [4]. According to **Odlaug et al.** [5] prevalence of sexual addiction among young adults is 2%, and is associated with symptoms of anxiety, depression, and a range of psychosocial impairments.

This review aimed to examine the occurrence of sexual addiction in patients with substance use disorder. We hypothesized that patients with substance use disorder have a higher level of sexual addiction when compared to individuals not suffering from substance use disorder.

Substance Use Disorder:

Substance use disorder is characterized by the excessive use of illicit substances, resulting in negative impacts on one's social, occupational, and academic functioning. Illicit substances that are frequently found include sedatives, cannabis, hypnotics, inhalants, anxiolytics, opioids, stimulants and hallucinogens. Substance use disorders are characterized by the following specific elements: intoxication, abuse and psychological/physical dependence [6].

Various substances may be categorized according to their impact on the central nervous system. The effects of these substances vary depending on the specific substance, and might range from profound sedation to euphoria and elevated energy. Typically, during the early phases of drug use disorders, people undergo positive reinforcement, which is

experiencing a sense of euphoria or well-being as a result of using the substance. The consequences of this reinforcement might differ substantially. As an individual develops psychological and physiological dependence, they are exposed to negative reinforcement in the form of substances that predominantly alleviate feelings of dysphoria and uncomfortable withdrawal symptoms [7].

Definition of substance use disorder:

Substance use disorder is defined as having significant biological, psychological, or sociological problems and continuing to use the drug that is causing the problem(s). By this model, the patient does not have problems in all three areas, or even two, to be considered substance dependent [8]

Epidemiology:

Substance use disorders (SUDs) are extremely prevalent. According to a nationwide study conducted in the United States, around 14.5% of individuals aged 12 or older were determined to have a diagnosable SUD in the preceding year. Out of this proportion, 10.2% exhibited symptoms of an alcohol use disorder, while 6.6% had symptoms of an illicit substance use disorder. A significant share of emergency department visits in the United States are attributed to the misuse of drugs, including illegal substances and the improper use

of medications, either on their own or in conjunction with alcohol. The 12-month period ending in October 2021 witnessed 105,752 overdose fatalities, according to the National Center for Health Statistics of the Centers for Disease Control and Prevention of the United States [9].

5% of the global population (approximately 200 million individuals aged 15–64) report using at least one illicit substance annually. Marijuana has the highest overall use rate, with a prevalence of 3.8%. In comparison, cocaine and heroin have a usage rate of 0.3%, amphetamines and opiates 0.6%, and ecstasy 0.2% [10].

Pathophysiology:

SUDs encompass both physical and psychological dependency on the substance(s) being used. Incapability to control one's substance use is a hallmark of severe dependence. SUDs and addiction may be attributed, at least in part, to brain adaptations that occur in an effort to restore homeostasis. Chronic and/or sustained stress significantly contributes to the development of drug-seeking behavior by altering the corticotropin-releasing factor and hypothalamic-pituitary-adrenal axis (CRF/HPA). Animal model studies have shown that CRF circuitry may enhance "dopamine activity in the mesolimbic reward circuit" [7].

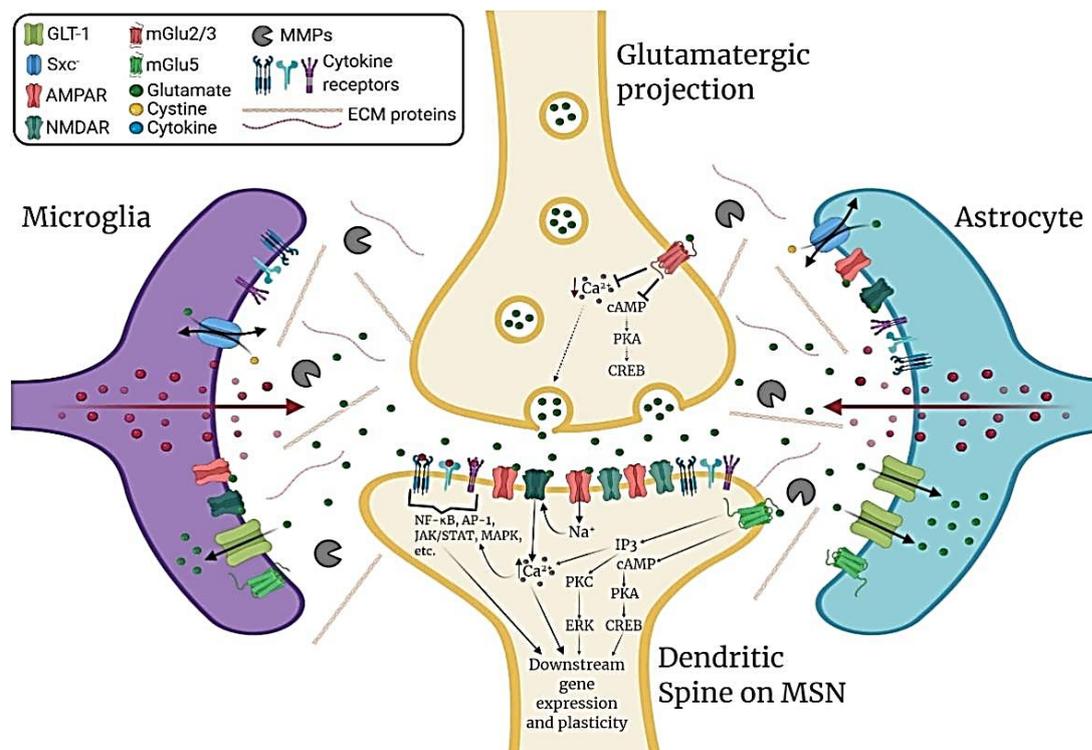


Figure (1): pathophysiology of SUD [11]

Evaluation:

Initially, during the evaluation process, the clinician adopts a non-judgmental stance towards the patient. Recovery and goal setting should be the focus of the provider's addiction treatment. Establishing rapport between the provider and patient is predicated on the manner in which the initial interview is executed. Always complete the history and physical as part of the assessment process. Furthermore, the medical provider should acquire a comprehensive set of laboratory tests to aid in the evaluation of the patient's health [12]. Recommended laboratory testing consist of the following: Urine drug screen and blood alcohol level to detect acute substance use. Typically performed in the emergency room when the patient displays signs of cognitive impairment, sedation or agitation. Additionally, urine pregnancy tests should be performed when necessary [13].

The basic metabolic panel (BMP) can reveal any abnormal electrolyte imbalance related to drug use and any other co-morbidity while the complete blood count (CBC) may detect the presence of infection and anaemia. The liver function test and hepatitis panel can detect hepatitis B and C infections caused by intravenous drug use, as well as any adverse effects of chronic alcohol or substance use on the liver. Furthermore, it is advisable to do an HIV antibody test in order to exclude the potentiality of infection resulting from intravenous drug use. The serum level of pancreatic enzymes can indicate any abnormalities in the pancreas resulting from heavy nicotine usage and excessive alcohol use [7].

Sexual addiction:

Sexual addiction is a condition distinguished by intrusive and repetitive sexual thoughts and fantasies, excessive sexual behaviours, and a lack of control over one's own sexual desire. This leads to distress and impairment in one's relationships and social life. Despite, being proposed as a distinct condition in the most recent edition of the Diagnostic and Statistical Manual of Mental Disorders (Fifth edition) [DSM-5], sexual addiction disorder or hypersexuality disorder was ultimately excluded [4]. On the contrary, the World Health Organization has made preparations to incorporate excessive sexual behaviour as a disorder of sexual compulsive behaviour into the most recent version of the International Classification of Diseases (ICD-11) [14].

Types:

In general, compulsive sexual behaviour falls into two classifications: paraphilic and nonparaphilic:

Paraphilias: Paraphilias are characterized by repetitive, intense, deviant, sexually arousing fantasies, sexual behaviours and urges lasting for a minimum six months and marked by personal distress or indications of substantial psychosocial impairment related to sexual

behaviour. Paraphilias are generally defined as socially objectionable behaviours involving non-human objects, one's own or one's partner's suffering, children, or a non-consenting individual [15].

Non-paraphilic CSB: which is characterized by more typical sexual desires, include sexual actions performed compulsively with multiple partners, constant fixation on a partner that may be considered unobtainable, compulsive use of pornography, compulsive masturbation, and compulsive sex and sexual acts within a consensual relationship. Non-paraphilic compulsive sexual behaviour (CSB) is not officially acknowledged in the DSM-5. However, during the DSM revision process, diagnostic criteria were suggested for CSB, which was referred to as Hypersexuality Disorder [16].

Etiology and Neurobiology

No substantial evidence exists to substantiate the aetiology of "sexual addiction". The majority of scholarly literature concerning etiological mechanisms is grounded in theoretical frameworks, including the incomplete monoamine hypothesis, endocrine dysfunction, courtship disorder, social learning theory, developmental processes, and psychodynamic views. Limited knowledge exists on the brain pathways responsible for regulating sexual behaviour and cognition. Serotonin, dopamine and androgenic hormones are believed to have a crucial role [17].

The neurobiological underpinnings of addiction begin with the brain's reward circuitry, particularly the mesolimbic reward system. This region is crucial for comprehending the fundamental mechanisms behind the development of addictive behaviours. There is a scarcity of literature about brain imaging during both pathological and conventional sexual functioning. Similar to substance abuse, reward circuits such as endogenous opiate and the dopaminergic systems have been implicated in the process of sexual behaviour [18].

The conventional definition of addiction is dependency on a substance that "hijacks" the reward system. The potential for addiction to develop even in the absence of drug use is supported by any stimulus (behaviour or drug) that converts the basic drive needed for survival (such as thirst, feeding, or reproduction) into craving/seeking or repetitive out-of-control behaviours [19].

Therefore, behavioural addictions may exhibit precisely the same pathways as those attributed to chemical dependency. Hence, the theory that, 'if one can alter neurocircuitry with illicit drugs and pharmacology, then one can alter it with behavior as well [19]

Assessment:

Sexual addiction disorder treatment-seeking individuals constitute a heterogeneous group. Consequently, it is critical to perform a thorough

evaluation in order to determine the specific psychopathology that requires management [20]. The comprehensive clinical interview is the most critical part of assessment. It should encompass the following: a history of the presenting problem, sexual history, substance use, psychosocial history, psychiatric and mental health history, and medical history [21].

Sexual addiction can manifest as a symptom of an underlying medical condition, like bipolar disorder or dementia, and can be both organic and substance-related. It is crucial not to disregard the possibility that the patient has acquired a sexually transmitted disease [22]. Rating scales and questionnaires can be employed as supplementary data collection methods as well (Table 1).

In addition to interviewing the patient, supplemental information may also be obtained from a spouse/partner or family members, who can provide objective description of the patient's observed behaviours. Typically, clinicians thoroughly investigate the following components in order to develop a diagnosis formulation and treatment strategy [21].

Table (1): Questionnaires and instruments for assessing sexual addiction [21].

- | |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ol style="list-style-type: none">1. The Sexual Inhibition/Sexual Excitation Scale: Measures the propensity for sexual inhibition and sexual excitation in men.2. Sexual Interest and Activity Scale: Rates the frequency of sexual thoughts and acts over the past week in a Likert scale.3. Intensity of Sexual Desire and Symptoms Scale: Rates the frequency and intensity of sexual fantasies over the past week and frequency of deviant behaviors over the past month.4. Compulsive Sexual Behavior Inventory: Assesses compulsive sexual behavior and risk for unsafe sex.5. Sexual Compulsivity Scale: Assesses the impact of sexual thoughts on daily functioning and the inability to control sexual thoughts or behaviors.6. Sexual Addiction Screening Test: Evaluates presence of sexual addiction in heterosexual and homosexual males.7. Hypersexual Behavior Inventory: Measures 3 dimensions of hypersexuality—control, coping, and consequences.8. Sexual Outlet Inventory: Documents the incidence and frequency of sexual fantasies, urges, and activities. |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Level of impairment, diminished control, and consequences:

Patients diagnosed with sexual addiction disorder may have a lack of control over their sexual behaviours, leading to repetitive sexual behaviours that have undesirable consequences and hinder their overall functioning. Consequences may be divorce, job loss,

marital conflicts and so on. Hence, clinicians must assess the degree to which sexual addiction is negatively impacting the patient's occupational, social, and other crucial aspects of their life, as well as the negative life events and distress resulting from the disorder [23].

Management

Receiving an accurate diagnosis is the initial step in treatment. Prior to making an accurate diagnosis, medical causes of hypersexuality must be ruled out. Specific neurological abnormalities might lead to individuals displaying improper behaviour and perhaps experiencing hypersexuality as a consequence. Examples include Pick's Disease, which impairs the regulation of socially acceptable behaviours, Kleine-Levin Syndrome (which causes hypersomnia, which can lead to abnormal behaviour such as hypersexuality), and Alzheimer's disease, which affects the frontal and temporal lobes and is associated with sexual disinhibition in 4.3%–9.0% of patients. Additionally, certain illicit substances and medications, including dopamine agonists used to treat Parkinson's disease, GHB, methamphetamine and cocaine can increase sexual desire [24].

• **Psychosocial Approaches:**

Psychotherapeutic strategies for addressing compulsive sexual behaviour encompass several approaches. Patrick Carnes introduced a Task-Centered Approach, involving 30 tasks guiding individuals through recovery steps, complementing 12-step programs like Sexaholics Anonymous. Carnes' approach involves various task lists, like identifying consequences, seeking therapy, and disclosing to a therapist and sponsor, aiding in early and long-term recovery, as well as family-focused rehabilitation. These tasks, closely linked to 12-step recovery, are adaptable to other therapeutic methods, aiding in relapse prevention and cognitive-behavioural therapy. Approaching problematic sexual behaviour as an addiction allows for the extension of established therapeutic methods such as cognitive-behavioral approaches, motivational enhancement therapy, emotional awareness, and mindfulness-based practices, commonly coupled with 12-step recovery groups [25, 26].

Coleman *et al.* [27] presented a comprehensive therapeutic model centered on identity formation and intimacy development in relationships. They advocate for extensive diagnostic assessments to tailor brief psychoeducational therapies, emphasizing the understanding of behavioral patterns and consequences, and motivating healthier sexual practices. Intensive therapy involves addressing boundaries, family dynamics, trauma effects, emotion management, paving the way for growth in identity, self-esteem, intimacy, authenticity, and positive sexuality. Their approach employs various psychotherapeutic modalities (behavioural, cognitive-behavioural, systems/family,

exposure-based, commitment and acceptance, life review) in individual, couple, and group settings, yet empirical evidence specifically supporting any approach for problematic sexual behaviour remains limited [27].

• **Pharmacological Approaches**

Pharmacological treatment for problematic sexual behavior employs two main medication categories: Selective serotonin reuptake inhibitors (SSRIs) and antiandrogens. SSRIs, often prescribed in the initial abstinence phase, address dysphoric mood symptoms; meanwhile, antiandrogens like cyproterone acetate and medroxyprogesterone acetate are utilized to reduce libido and control compulsive sexual behaviors. Naltrexone, an opioid antagonist, functions by curbing dopamine release, lessening the euphoric effects associated with sexual fantasies, although its use lacks extensive randomized trial evidence for treating sexual addiction. Open-label trials, however, suggest that high doses of naltrexone may decrease the frequency of sexual thoughts and behaviors. This approach, including hormone therapies to suppress testosterone production, is typically reserved for managing paraphilias involving sexual offending, yet it shows potential benefits in mitigating hypersexuality in women [28].

Substance use disorder and sexual addiction:

1. Comorbidity of substance use disorder (SUD) and hypersexual behavior:

Numerous studies examining hypersexual behavior among individuals seeking help for SUDs highlight a common co-occurrence of SUDs in these populations. Research indicated notably high rates of alcohol abuse/dependence and substance misuse among those with hypersexual behavior [29].

2. Associations in treatment-seeking populations:

Studies have consistently shown that hypersexual individuals, especially those seeking treatment for sex addiction, often present with prevalent SUDs, including high rates of alcohol and drug abuse/dependence. Similarly, research indicated high rates of hypersexual behavior among individuals receiving treatment for various SUDs [30, 31].

3. Prevalence estimates and screening tools:

Estimates suggest a co-occurrence of sex addiction with SUDs at approximately 40%. Screening tools like the Sexual Addiction Screening Test-Revised (SAST-R) have been used in chemical dependency treatment settings to identify patients at risk for sexual addiction [29, 32].

4. Theoretical explanations and DSM-5 Criteria:

The reasons for the association between hypersexuality and SUDs are multifaceted. Some

theories suggest self-medication, mood regulation, common etiological factors (e.g., impulsivity and comorbid psychopathology), and addiction interaction as potential explanations. The DSM-5 criteria for hypersexual disorder differentiate substance-induced hypersexual behavior from coactive substance abuse [33, 34].

5. Implications and treatment considerations:

The association between SUDs and hypersexual behavior has implications for clinical interventions. Interventions targeting SUDs may potentially alleviate hypersexual behavior. When both conditions coexist, interventions should address each problem individually and consider their combined effects, necessitating specialized treatment for dual diagnosis patients [35, 36].

CONCLUSION

Ongoing controversies persist regarding the definition, diagnosis, and treatment of sexual addiction, emphasizing the urgent need to develop strategies for its identification and management due to its significant impact on affected individuals. Although limited studies have specifically explored the correlation between substance use disorder (SUD) and sexual addiction, existing data strongly suggest a robust co-occurrence between these conditions. Comprehensive research is essential to thoroughly elucidate the correlation between SUD and sexual addiction and understand their reciprocal impact.

- **Financial support and sponsorship:** Nil.
- **Conflict of Interest:** Nil.

REFERENCES

1. **Stavro K, Rizkallah E, Dinh-Williams L, Chiasson J, Potvin S (2013):** Hypersexuality among a Substance Use Disorder Population. *Sexual Addiction & Compulsivity*, 20: 210-6.
2. **McLellan A (2017):** Substance Misuse and Substance use Disorders: Why do they Matter in Healthcare? *Trans Am Clin Climatol Assoc.*, 128: 112-30.
3. **Leeman R, Potenza M (2013):** A targeted review of the neurobiology and genetics of behavioural addictions: an emerging area of research. *Can J Psychiatry*, 58: 260-73.
4. **Perrotta G (2020):** Dysfunctional sexual behaviors: definition, clinical contexts, neurobiological profiles and treatments. *International Journal of Sexual and Reproductive Health Care*, 12: 10-15.
5. **Odlaug B, Lust K, Schreiber L et al. (2013):** Compulsive sexual behavior in young adults. *Ann Clin Psychiatry*, 25: 193-200.
6. **Dugosh K, Cacciola J (2018):** Clinical assessment of substance use disorders. *UpToDate Inc.*, 19: 8-14.
7. **Jahan A, Burgess D (2023):** Substance Use Disorder. *Treasure Island (FL) ineligible companies. Disclosure: Doug Burgess declares no relevant financial relationships with ineligible companies. Biomedicines*, 5: 6-13.

8. **Milhorn H, Milhorn H (2018):** Definitions of Substance Dependence. *Substance Use Disorders: A Guide for the Primary Care Provider. J Community Hosp Intern Med Perspect.*, 10: 117–126.
9. **Cartus AR, Li Y, Macmadu A et al. (2022):** Forecasted and Observed Drug Overdose Deaths in the US During the COVID-19 Pandemic in 2020. *JAMA Netw Open*, 5: e223418.
10. **Chaouali N, Moslah B, Salem K et al. (2021):** Illicit substances identified in the urine of 11,170 suspected drug users in North Tunisia. *Pan Afr Med J.*, 38: 20.
11. **Namba M, Leyrer-Jackson J, Nagy E, Olive M, Neisewander J (2021):** Neuroimmune Mechanisms as Novel Treatment Targets for Substance Use Disorders and Associated Comorbidities. *Front Neurosci.*, 15: e650785.
12. **Vahdat S, Hamzehgardeshi L, Hessam S, Hamzehgardeshi Z (2014):** Patient involvement in health care decision making: a review. *Iran Red Crescent Med J.*, 16: e12454.
13. **Kowalski J, Kopec K, Lavelle J, Osterhoudt K (2017):** A Novel Agent for Management of Agitated Delirium: A Case Series of Ketamine Utilization in the Pediatric Emergency Department. *Pediatr Emerg Care*, 33: e58-e62.
14. **Oltmanns J (2021):** Personality Traits in the International Classification of Diseases 11th Revision (ICD-11). *Curr Opin Psychiatry*, 34: 48-53.
15. **George M, Maheshwari S, Chandran S et al. (2018):** Psychosocial intervention for sexual addiction. *Indian J Psychiatry*, 60: S510-s3.
16. **Rosenberg K, Carnes P, O'Connor S (2014):** Evaluation and treatment of sex addiction. *J Sex Marital Ther.*, 40: 77-91.
17. **Forbes M, Baillie A, Eaton N, Krueger R (2017):** A Place for Sexual Dysfunctions in an Empirical Taxonomy of Psychopathology. *J Sex Res.*, 54: 465-85.
18. **Meyer M (2018):** Understanding sexual addiction and hypersexuality: An integrative approach to treatment. *Integrative sexual health*, 2: 343-94.
19. **Koob G, Volkow N (2016):** Neurobiology of addiction: a neurocircuitry analysis. *Lancet Psychiatry*, 3: 760-73.
20. **Briken P (2020):** An integrated model to assess and treat compulsive sexual behaviour disorder. *Nat Rev Urol.*, 17: 391-406.
21. **Sahithya B, Kashyap R (2022):** Sexual Addiction Disorder— A Review With Recent Updates. *Journal of Psychosexual Health*, 4: 95-101.
22. **Bielenberg J, Swisher G, Lembke A, Haug N (2021):** A systematic review of stigma interventions for providers who treat patients with substance use disorders. *Journal of Substance Abuse Treatment*, 131: 108486.
23. **Koós M, Bóthe B, Orosz G et al. (2021):** The negative consequences of hypersexuality: Revisiting the factor structure of the Hypersexual Behavior Consequences Scale and its correlates in a large, non-clinical sample. *Addict Behav Rep.*, 13: 100321.
24. **Walton M, Cantor J, Bhullar N, Lykins A (2017):** Hypersexuality: A Critical Review and Introduction to the "Sexbehavior Cycle". *Arch Sex Behav.*, 46: 2231-51.
25. **Turner D, Briken P, Grubbs J et al. (2022):** The World Federation of Societies of Biological Psychiatry guidelines on the assessment and pharmacological treatment of compulsive sexual behaviour disorder. *Dialogues Clin Neurosci.*, 24: 10-69.
26. **Blåsjö V (2022):** Operationalism: An Interpretation of the Philosophy of Ancient Greek Geometry. *Foundations of Science*, 27: 587-708.
27. **Coleman E, Dickenson J, Girard A et al. (2018):** An Integrative Biopsychosocial and Sex Positive Model of Understanding and Treatment of Impulsive/Compulsive Sexual Behavior. *Sexual Addiction & Compulsivity*, 25: 1-28.
28. **Higgins A, Nash M, Lynch A (2010):** Antidepressant-associated sexual dysfunction: impact, effects, and treatment. *Drug Healthc Patient Saf.*, 2: 141-50.
29. **Reid R, Meyer M (2016):** Substance Use Disorders in Hypersexual Adults. *Current Addiction Reports*, 3: 35-9.
30. **Karlsson M, Zielinski M (2020):** Sexual Victimization and Mental Illness Prevalence Rates Among Incarcerated Women: A Literature Review. *Trauma Violence Abuse*, 21: 326-49.
31. **Farré J, Fernández-Aranda F, Granero R et al. (2015):** Sex addiction and gambling disorder: similarities and differences. *Compr Psychiatry*, 56: 59-68.
32. **Brem M, Shorey R, Anderson S, Stuart G (2017):** Experiential Avoidance as a Mediator of the Relationship between Dispositional Mindfulness and Compulsive Sexual Behaviors among Men in Residential Substance Use Treatment. *Sex Addict Compulsivity*, 24: 257-69.
33. **Leyton M, Vezina P (2014):** Dopamine ups and downs in vulnerability to addictions: a neurodevelopmental model. *Trends Pharmacol Sci.*, 35: 268-76.
34. **Prause N, Steele V, Staley C, Sabatinelli D, Hajcak G (2015):** Modulation of late positive potentials by sexual images in problem users and controls inconsistent with "porn addiction". *Biol Psychol.*, 109: 192-9.
35. **Saunders B, Robinson T (2013):** Individual variation in resisting temptation: implications for addiction. *Neurosci Biobehav Rev.*, 37: 1955-75.
36. **Shorey R, Elmquist J, Gawrysiak M, Anderson S, Stuart G (2016):** The relationship between mindfulness and compulsive sexual behavior in a sample of men in treatment for substance use disorders. *Mindfulness*, 7: 866-73.