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Sexual development in ADHD and internet pornography consumption

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Development of sexual identity during adolescence is a major process of transition in individual life which in cases of ADHD specifically interacts with other ontogenetic, pathological and psychosocial conditions. According to recent findings growing consumption of internet pornography mainly in male ADHD population is closely related to compulsive sexual behavior and hypersexuality. Recent findings also indicate that consumption of internet pornography in ADHD individuals and other sexual activities may serve as a mood-altering “self-medication” which may help to cope with stressful events and decrease depression and anxiety. Taken together recent findings indicate that internet pornography consumption mainly in ADHD individuals is closely related to stressful experiences, anxiety, depression and identity problems in partnerships which significantly increase their vulnerability to the so-called “problematic pornography use” and other forms of addictive sexual behavior. From this developmental perspective “problematic pornography use” in ADHD individuals represents significant epidemiological problem which requires further research mainly with focus on clinical diagnostics and treatment.

KEYWORDS

ADHD, pornography, compulsive behavior, hypersexuality, anxiety, depression

Introduction

Development of sexual identity is a major process of transition in individual life that is mainly established during adolescence, and it is related to various physiological, anatomical and behavioral changes leading to development of sexual activities and fantasies (1–4). Mainly, sexual maturation, various emotional changes, development of abstract thinking, sexual identity, self-consciousness and also anatomical changes related to rapid physical growth (5–7). This complex developmental process is related to various internal and external factors, including various ontogenetic, neuropathological, social and environmental conditions that may influence sexual functions and behavior (2, 5, 7–14).

One of these specific pathological influences that may negatively affect normal development of sexual functioning and behavior is Attention Deficit and Hyperactivity Disorder (ADHD) mainly because executive dysfunctions usually related to ADHD may cause various problems mainly related to impulsivity and hypersexuality, aggressive behavior and other problems which may negatively affect psychological development of sexual identity and sexual functioning (7, 13, 15). According to recent meta-analyses ADHD manifests worldwide and affects at about 5.3% of child population and 2.5% of adults (5, 7, 13–18). The core symptoms of ADHD are inattention, hyperactivity and impulsivity and the disease is closely associated with various problems in daily performing and social functioning and adaptation (19, 20) including difficulties

in academic and professional life, and interpersonal relationships in comparison to individuals without ADHD (19–21).

Nevertheless, the diagnosis of ADHD as a developmental disorder according to the DSM-5 requires clear evidence that the symptoms may reduce the quality of life and everyday functioning mainly associated with a variety of risks factors (22–24). Usually individuals with ADHD manifest poor school performance and their professional success is often negatively impaired in comparison to individuals without ADHD (25, 26). In addition, there is evidence that ADHD also increases the risk of criminal behavior and various forms of rule violations (27, 28) as well as significant deficits in interpersonal relationships (5, 7, 29–33).

In this context, some studies also reported lower relational satisfaction, impaired quality of romantic relationships, higher rate of separations and divorces, increased risk of intimate partner violence and verbal violence (29, 34) and more maladaptive coping strategies in ADHD individuals (3, 4, 6, 35, 36). Additionally, people with ADHD are reported to be victims of sexual violence more frequently (37). Regarding a direct influence of ADHD on development of sexual functions recent findings suggest that no differences were found regarding the age of puberty onset in children with ADHD, and ADHD does not appear to be associated with delayed or impaired sexual maturation in comparison with children without ADHD (38–41).

Attention deficit and hyperactivity disorder impulsivity and hypersexuality

Although ADHD likely has no direct influence on individual development and on sexual maturation in comparison to individuals without ADHD there is evidence that psychological development of sexual identity and functions is significantly affected by ADHD (7, 13, 15). In addition ADHD has frequent manifestations of comorbidities mainly mood disorders and anxiety disorders (15, 32, 39, 41, 42) and a frequent comorbid disorder related to ADHD is hypersexuality (7, 13, 32). Some studies also show positive associations between impulsivity and hypersexuality (1, 4, 42, 43) and inattentive symptoms also may be related to hypersexuality (32, 44, 45). In addition some findings suggest that sexual activities may serve as mood-altering “self-medication” process in some individuals with ADHD (7, 13, 32, 42, 46–48).

Basic mechanism for this “self-medication” might be reward deficiency that is typical of ADHD (49) which can be related to addictive, impulsive, compulsive and risky sexual behaviors (5, 7, 50–52). Other studies indicate that conduct problems during childhood and adolescence could also be a relevant factor of the relationship between ADHD and sexual risk behaviors (13, 53, 54). In addition conduct problems are often associated with increased impulsive behaviors (7, 13, 55–58).

In this context, some findings suggest that risky sexual behaviors in ADHD individuals represent a dysfunctional form of emotional regulation (7, 13, 59, 60), which may be also a relevant risk factor for sexual victimization (61–68). In addition, some research studies show that people with ADHD have increased tendencies to promiscuity and according to recent findings ADHD individuals have more sexual partners than people without ADHD (23, 69–72).

Compulsive sexual behavior, problematic pornography use and ADHD

According to recent findings hypersexuality is frequently related to compulsive form of sexual behavior (CSB) usually characterized by unsuccessful effort to control excessive sexual behavior that may lead to various psychopathological symptoms and negatively affect close relationships and partnership, and significantly decrease quality of life (1, 3, 4, 6, 47, 61, 62, 66, 73–77). A highly prevalent form of compulsive sexual behavior in ADHD individuals is “problematic internet pornography use” (PPU) (6, 7, 13, 47, 59, 60, 76–79).

In this context, some studies indicate a strong association between ADHD and CSB (7, 13, 59, 60, 80, 81) and other findings show that ADHD represents a risk factor for problematic pornography use (PPU) as a manifestation of hypersexual phantasies (1, 3–6, 82). For example, a recent study examining the motivations behind Internet porn use found that men revealed much stronger motivations than women and those with more erotophilic tendencies were more motivated to use Internet pornography (6, 47).

As epidemiological findings indicate, PPU in ADHD population but also in the general population became a widespread problem for mental health due to unlimited access of pornographic material on the internet and the availability of the internet (6, 61, 62, 76, 80, 83–86) and recent evidence shows that a significant percentage of people (5–14%) who use pornography may encounter problematic pornography use (PPU) (6, 61, 62, 80, 83, 87, 88).

In the 11th edition of the International Classification of Diseases (ICD-11), PPU is characterized by persistent, excessive, or compulsive use of pornographic content and intensive participation in it, despite distress and adverse consequences (7, 13, 59, 60, 78, 80, 81, 87, 89–93). Nevertheless, some researchers consider the conceptualization of PPU as an impulse control disorder or a highly addictive form of sexual behavior (39, 94, 95).

Some studies also suggest that ADHD symptoms may represent significant predictive factor for PPU (5–7, 96–98) which is in agreement with other findings documenting that impulsivity, problematic sexual behaviors, CSB, hypersexuality are significantly related to PPU (1, 3–6, 84, 99). For example, Niazof et al. (7) reported a high rate of co-occurring ADHD in hypersexual people and found that nearly a quarter of 361 treatment-seeking hypersexual adult men were diagnosed with ADHD and that majority of them (96.4%) met diagnostic criteria for the inattentive subtype of ADHD. Other studies also indicate that PPU can be considered as a specific form of hypersexual behavior (1, 7, 42, 80, 83) and ADHD symptoms have moderate positive associations with hypersexuality in both men and women (5, 7, 61, 62, 80, 83). Other findings show that ADHD individuals report increased sexual desire, more masturbation frequency, less sexual satisfaction, and more sexual dysfunctions than the general population (6, 47, 61, 62, 80, 83).

In addition some findings suggest that hypersexuality and PPU might be related to anxiety due to difficulties in forming a secure attachment during individual psychological development (100–102). Due to this deficit people with anxious insecure attachment may be more vulnerable and tend to seek sexual relationships without appropriate emotional intimacy (6, 47, 77, 78, 103–105). These developmental attachment deficits seem to be confirmed by findings that anxiety disorders represent significant comorbid conditions of ADHD

(15, 106, 107) and these anxiety symptoms are related to pornography consumption (6, 108–114). In this context, other studies documenting PPU epidemiology indicate that PPU is mainly related to symptoms of anxiety and depression (41, 76, 89, 115–120), and also to obsessive–compulsive symptoms (6, 47, 121).

This severity of PPU as a mental health problem is documented by recent research which indicates that more than 80% of people seeking treatment for a compulsive sexual behavior disorder reported an inability to control their use of pornography, despite negative consequences (41, 78, 122–126). Typical negative consequences of PPU may lead to various psychological and physiological deficits and symptoms, as for example depressive symptoms, guilty feelings, anxiety symptoms, various negative consequences related to forming of sexual identity, body image problems, decreased ability to create relationships with potential partners, emotional numbness, tendencies to social isolation, increased aggression and violent behavior, and may also negatively affect sexual functioning such as hypersexuality, erectile dysfunctions and also some sexual dysfunctions in women such as decreased sexual desire or anorgasmia (6, 78).

This increased interest to experience online pornography likely will increase susceptibility to PPU not just in ADHD individuals but also in general population and as some findings indicate PPU is associated with various sexual dysfunctions (127–132).

Discussion

Recently mental health problems related to pornography use became epidemiologically significant mainly because of severe increase in online pornography consumption by pre-adolescent children and adolescents (9–12, 76, 78), which can have serious future adverse consequences [(47, 89, 118, 128, 133, 134); Gola et al., 2016].

From this perspective further research regarding PPU and its clinical diagnostics and treatment represent significant epidemiological problem. Although the Compulsive Sexual Behavior Disorder (CSBD) is included in the International Statistical Classification of Diseases and Related Health Problems (ICD-11) (135), there is no official diagnosis for the problematic pornography use (PPU) (136). Nevertheless, since PPU is often considered a manifestation of CSBD, the same diagnostic guidelines can be applied (136).

Currently the evidence-based treatment methods of PPU, other forms of problematic online sexual behavior and CSBD in ADHD and other psychiatric patients (126, 137–143), mainly include cognitive behavioral therapy (CBT), acceptance and commitment therapy (ACT), interview techniques motivational and mindfulness based approaches (126, 137–143).

References

- Böthe B, Tóth-Király I, Potenza MN, Griffiths MD, Orosz G, Demetrovics Z. Revisiting the role of impulsivity and compulsivity in problematic sexual behaviors. *J Sex Res.* (2019) 56:166–79. doi: 10.1080/00224499.2018.1480744
- Fortenberry JD. Puberty and adolescent sexuality. *Horm Behav.* (2013) 64:280–7. doi: 10.1016/j.yhbeh.2013.03.007
- Mulhauser KR, Struthers WM, Hook JN, Pyykkonen BA, Womack SD, MacDonald M. Performance on the Iowa gambling task in a sample of hypersexual men. *Sex Addict Compuls.* (2014) 21:170–83. doi: 10.1080/10720162.2014.908333
- Walton MT, Cantor JM, Lykins AD. An online assessment of personality, psychological, and sexuality trait variables associated with self-reported hypersexual behavior. *Arch Sex Behav.* (2017) 46:721–33. doi: 10.1007/s10508-015-0606-1
- Böthe B, Koós M, Tóth-Király I, Orosz G, Demetrovics Z. Investigating the associations of adult ADHD symptoms, hypersexuality, and problematic pornography use among men and women on a largescale, non-clinical sample. *J Sex Med.* (2019) 16:489–99. doi: 10.1016/j.jsxm.2019.01.312

In this context of the treatment of ADHD individuals it is important to take into account that their PPU related problems may be related to their “reward deficiency” and “increased sensitivity” (49, 54, 71, 76, 144, 145). Mainly because there is evidence that the prefrontal cortex (PFC) is overactive in people with ADHD (8, 15, 146) that is related to attention deficits, which may cause a self-regulatory attempts (called as “self-medication” behavior) manifesting as increased needs to experience sexual desire (6, 32, 76, 78, 147). From these perspectives PPU and other addictive forms of sexual behavior in ADHD individuals represent significant epidemiological problem which requires further clinical research mainly focused on underlying psychophysiological mechanisms, clinical diagnostics and treatment options.

Data availability statement

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

Author contributions

MP and PB did the research and wrote the manuscript. All authors contributed to the article and approved the submitted version.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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6. Levi G, Cohen C, Kaliche S, Sharaabi S, Cohen K, Tzur-Bitan D, et al. Sexual addiction, compulsivity, and impulsivity among a predominantly female sample of adults who use the internet for sex. *J Behav Addict.* (2020) 9:83–92. doi: 10.1556/2006.2020.00007
7. Niazof D, Weizman A, Weinstein A. The contribution of ADHD and attachment difficulties to online pornography use among students. *Compr Psychiatry.* (2019) 93:56–60. doi: 10.1016/j.comppsy.2019.07.002
8. Bob P, Konicarova J, Raboch J. Disinhibition of primitive reflexes in attention deficit and hyperactivity disorder: insight into specific mechanisms in girls and boys. *Front Psych.* (2021) 12:430685. doi: 10.3389/fpsy.2021.430685
9. Grubbs JB, Kraus SW, Perry SL. Self-reported addiction to pornography in a nationally representative sample: the roles of use habits, religiousness, and moral incongruence. *J Behav Addict.* (2019) 8:88–93. doi: 10.1556/2006.7.2018.134
10. Lewczuk K, Wójcik A, Gola M. Increase in the prevalence of online pornography use: objective data analysis from the period between 2004 and 2016 in Poland. *Arch Sex Behav.* (2019) 51:1157–71. doi: 10.31234/osf.io/tmn4r
11. Price J, Patterson R, Regnerus M, Walley J. How much more XXX is generation X consuming? Evidence of changing attitudes and behaviors related to pornography since 1973. *J Sex Res.* (2016) 53:12–20. doi: 10.1080/00224499.2014.1003773
12. Rissel C, Richters J, De Visser RO, McKee A, Yeung A, Caruana T. A profile of pornography users in Australia: findings from the second Australian study of health and relationships. *J Sex Res.* (2017) 54:227–40. doi: 10.1080/00224499.2016.1191597
13. Schöttle D, Briken P, Tüscher O, Turner D. Sexuality in autism: hypersexual and paraphilic behavior in women and men with high-functioning autism spectrum disorder. *Dialogues Clin Neurosci.* (2017) 19:381–93. doi: 10.31887/DCNS.2017.19.4/dschoettle
14. Turner D, Briken P, Schöttle D. Sexual dysfunctions and their association with the dual control model of sexual response in men and women with high-functioning autism. *J Clin Med.* (2019) 8:425. doi: 10.3390/jcm8040425
15. Bob P, Konicarova J. *ADHD, stress, and development.* New York: Springer (2018).
16. Franke B, Michelini G, Asherson P, Banaschewski T, Billow A, Buitelaar JK, et al. Live fast, die young? A review on the developmental trajectories of ADHD across the lifespan. *Eur Neuropsychopharmacol.* (2018) 28:1059–88. doi: 10.1016/j.euroneuro.2018.08.001
17. Polanczyk G, De Lima MS, Horta BL, Biederman J, Rohde LA. The worldwide prevalence of ADHD: a systematic review and meta-regression analysis. *Am J Psychiatr.* (2007) 164:942–8. doi: 10.1176/ajp.2007.164.6.942
18. Simon V, Czobor P, Bálint S, Mészáros A, Bitter I. Prevalence and correlates of adult attention-deficit hyperactivity disorder: meta-analysis. *Br J Psychiatry.* (2009) 194:204–11. doi: 10.1192/bjp.bp.107.048827
19. Reimherr FW, Roesler M, Marchant BK, Gift TE, Retz W, Philipp-Wiegmann F, et al. Types of adult attention-deficit/hyperactivity disorder: a replication analysis. *J Clin Psychiatry.* (2020) 81:21798. doi: 10.4088/JCP.19m13077
20. Retz W, Stieglitz RD, Corbisiero S, Retz-Junginger P, Rösler M. Emotional dysregulation in adult ADHD: what is the empirical evidence? *Expert Rev Neurother.* (2012) 12:1241–51. doi: 10.1586/ern.12.109
21. Pollak Y, Dekkers TJ, Shoham R, Huizenga HM. Risk-taking behavior in attention deficit/hyperactivity disorder (ADHD): a review of potential underlying mechanisms and of interventions. *Curr Psychiatry Rep.* (2019) 21:33–11. doi: 10.1007/s11920-019-1019-y
22. Barkley RA, Fischer M, Smallish L, Fletcher K. Young adult outcome of hyperactive children: adaptive functioning in major life activities. *J Am Acad Child Adolesc Psychiatry.* (2006) 45:192–202. doi: 10.1097/01.chi.0000189134.97436.e2
23. Shaw M, Hodgkins P, Caci H, Young S, Kahle J, Woods AG, et al. A systematic review and analysis of long-term outcomes in attention deficit hyperactivity disorder: effects of treatment and non-treatment. *BMC Med.* (2012) 10:1–15. doi: 10.1186/1741-7015-10-99
24. Sedgwick JA, Merwood A, Asherson P. The positive aspects of attention deficit hyperactivity disorder: a qualitative investigation of successful adults with ADHD. *ADHD Attent Defic Hyperact Disord.* (2019) 11:241–53. doi: 10.1007/s12402-018-0277-6
25. Jangmo A, Stålhandske A, Chang Z, Chen Q, Almqvist C, Feldman I, et al. Attention-deficit/hyperactivity disorder, school performance, and effect of medication. *J Am Acad Child Adolesc Psychiatry.* (2019) 58:423–32. doi: 10.1016/j.jaac.2018.11.014
26. Küpper T, Haavik J, Drexler H, Ramos-Quiroga JA, Wermelskirchen D, Prutz C, et al. The negative impact of attention-deficit/hyperactivity disorder on occupational health in adults and adolescents. *Int Arch Occup Environ Health.* (2012) 85:837–47. doi: 10.1007/s00420-012-0794-0
27. Retz W, Ginsberg Y, Turner D, Barra S, Retz-Junginger P, Larsson H, et al. Attention-deficit/hyperactivity disorder (ADHD), antisociality and delinquent behavior over the lifespan. *Neurosci Biobehav Rev.* (2021) 120:236–48. doi: 10.1016/j.neubiorev.2020.11.025
28. Vaa T. ADHD and relative risk of accidents in road traffic: a meta-analysis. *Accid Anal Prev.* (2014) 62:415–25. doi: 10.1016/j.aap.2013.10.003
29. Biederman J, Faraone SV, Spencer TJ, Mick E, Monuteaux MC, Aleardi M. Functional impairments in adults with self-reports of diagnosed ADHD: a controlled study of 1001 adults in the community. *J Clin Psychiatry.* (2006) 67:524–40. doi: 10.4088/jcp.v67n0403
30. De Boo GM, Prins PJ. Social incompetence in children with ADHD: possible moderators and mediators in social-skills training. *Clin Psychol Rev.* (2007) 27:78–97. doi: 10.1016/j.cpr.2006.03.006
31. Gardner DM, Gerdes AC. A review of peer relationships and friendships in youth with ADHD. *J Atten Disord.* (2015) 19:844–55. doi: 10.1177/1087054713501552
32. Reid RC, Davtian M, Lenartowicz A, Torrevillas RM, Fong TW. Perspectives on the assessment and treatment of adult ADHD in hypersexual men. *Neuropsychiatry.* (2013) 3:295–308. doi: 10.2217/np.13.31
33. Solanto MV, Marks DJ, Mitchell KJ, Wasserstein J, Kofman MD. Development of a new psychosocial treatment for adult ADHD. *J Atten Disord.* (2008) 11:728–36. doi: 10.1177/1087054707305100
34. Eakin L, Minde K, Hechtman L, Ochs E, Krane E, Bouffard R, et al. The marital and family functioning of adults with ADHD and their spouses. *J Atten Disord.* (2004) 8:1–10. doi: 10.1177/108705470400800101
35. Bruner MR, Kuryluk AD, Whitton SW. Attention-deficit/hyperactivity disorder symptom levels and romantic relationship quality in college students. *J Am Coll Heal.* (2015) 63:98–108. doi: 10.1080/07448481.2014.975717
36. Canu WH, Tabor LS, Michael KD, Bazzini DG, Elmore AL. Young adult romantic couples' conflict resolution and satisfaction varies with partner's attention-deficit/hyperactivity disorder type. *J Marital Fam Ther.* (2014) 40:509–24. doi: 10.1111/jmft.12018
37. Wymbs BT, Dawson AE, Suhr JA, Bunford N, Gidycz CA. ADHD symptoms as risk factors for intimate partner violence perpetration and victimization. *J Interpers Violence.* (2017) 32:659–81. doi: 10.1177/0886260515586371
38. Greenfield B, Hechtman L, Stehli A, Wigal T. Sexual maturation among youth with ADHD and the impact of stimulant medication. *Eur Child Adolesc Psychiatry.* (2014) 23:835–9. doi: 10.1007/s00787-014-0521-3
39. Kraus SW, Martino S, Potenza MN. Clinical characteristics of men interested in seeking treatment for use of pornography. *J Behav Addict.* (2016) 5:169–78. doi: 10.1556/2006.5.2016.036
40. Trzepacz PT, Spencer TJ, Zhang S, Bangs ME, Witte MM, Desai D. Effect of atomoxetine on Tanner stage sexual development in children and adolescents with attention deficit/hyperactivity disorder: 18-month results from a double-blind, placebo-controlled trial. *Curr Med Res Opin.* (2011) 27:45–52. doi: 10.1185/03007995.2011.599372
41. Wéry A, Vogelaere K, Challet-Bouju G, Poudat FX, Caillon J, Lever D, et al. Characteristics of self-identified sexual addicts in a behavioral addiction outpatient clinic. *J Behav Addict.* (2016) 5:623–30. doi: 10.1556/2006.5.2016.071
42. Reid RC, Carpenter BN, Gilliland R, Karim R. Problems of self-concept in a patient sample of hypersexual men with attention-deficit disorder. *J Addict Med.* (2011) 5:134–40. doi: 10.1097/ADM.0b013e3181e6ad32
43. Miner MH, Romine RS, Raymond N, Janssen E, MacDonald A, Coleman E. Understanding the personality and behavioral mechanisms defining hypersexuality in men who have sex with men. *J Sex Med.* (2016) 13:1323–31. doi: 10.1016/j.jsxm.2016.06.015
44. Blankenship R, Laaser M. Sexual addiction and ADHD: is there a connection? *Sex Addict Compuls.* (2004) 11:7–20. doi: 10.1080/10720160490458184
45. Kafka MP, Hennen J. The paraphilia-related disorders: an empirical investigation of nonparaphilic hypersexuality disorders in outpatient males. *J Sex Marital Ther.* (1999) 25:305–19. doi: 10.1080/00926239908404008
46. Gudjonsson GH, Sigurdsson JF, Sigfusdottir ID, Young S. An epidemiological study of ADHD symptoms among young persons and the relationship with cigarette smoking, alcohol consumption and illicit drug use. *J Child Psychol Psychiatry.* (2012) 53:304–12. doi: 10.1111/j.1469-7610.2011.02489.x
47. Smith KE, Lavender JM, Leventhal AM, Mason TB. Facets of impulsivity in relation to diet quality and physical activity in adolescence. *Int J Environ Res Public Health.* (2021) 18:613. doi: 10.3390/ijerph18020613
48. Wilens TE, Adamson J, Sgambati S, Whitley J, Santry A, Monuteaux MC, et al. Do individuals with ADHD self-medicate with cigarettes and substances of abuse? Results from a controlled family study of ADHD. *Am J Addict.* (2007) 16:14–23. doi: 10.1080/10550490601082742
49. Blum K, Chen ALC, Braverman ER, Comings DE, Chen TJ, Arcuri V, et al. Attention-deficit-hyperactivity disorder and reward deficiency syndrome. *Neuropsychiatr Dis Treat.* (2008) 4:893–918. doi: 10.2147/ndt.s2627
50. Curry I, Luk JW, Trim RS, Hopfer CJ, Hewitt JK, Stallings MC, et al. Impulsivity dimensions and risky sex behaviors in an at-risk young adult sample. *Arch Sex Behav.* (2018) 47:529–36. doi: 10.1007/s10508-017-1054-x
51. Charnigo R, Noar SM, Garnett C, Crosby R, Palmgreen P, Zimmerman RS. Sensation seeking and impulsivity: combined associations with risky sexual behavior in a large sample of young adults. *J Sex Res.* (2013) 50:480–8. doi: 10.1080/00224499.2011.652264
52. Dir AL, Coskunpinar A, Cyders MA. A meta-analytic review of the relationship between adolescent risky sexual behavior and impulsivity across gender, age, and race. *Clin Psychol Rev.* (2014) 34:551–62. doi: 10.1016/j.cpr.2014.08.004

53. Ramrakha S, Bell ML, Paul C, Dickson N, Moffitt TE, Caspi A. Childhood behavior problems linked to sexual risk taking in young adulthood: a birth cohort study. *J Am Acad Child Adolesc Psychiatry*. (2007) 46:1272–9. doi: 10.1097/chi.0b013e3180f6340e
54. Roekach A, Wiener J. The romantic relationships of adolescents with ADHD. *J Atten Disord*. (2018) 22:35–45. doi: 10.1177/1087054714538660
55. Fanti KA, Kyranides MN, Lordos A, Colins OF, Andershed H. Unique and interactive associations of callous-unemotional traits, impulsivity and grandiosity with child and adolescent conduct disorder symptoms. *J Psychopathol Behav Assess*. (2018) 40:40–9. doi: 10.1007/s10862-018-9655-9
56. Frick PJ. Integrating research on temperament and childhood psychopathology: its pitfalls and promise. *J Clin Child Adolesc Psychol*. (2004) 33:2–7. doi: 10.1207/S15374424JCCP3301_1
57. Holmes SE, Slaughter JR, Kashani J. Risk factors in childhood that lead to the development of conduct disorder and antisocial personality disorder. *Child Psychiatry Hum Dev*. (2001) 31:183–93. doi: 10.1023/a:1026425304480
58. Sebastian A, Retz W, Tüscher O, Turner D. Violent offending in borderline personality disorder and attention deficit/hyperactivity disorder. *Neuropharmacology*. (2019) 156:107565. doi: 10.1016/j.neuropharm.2019.03.008
59. Tull MT, Weiss NH, Adams CE, Gratz KL. The contribution of emotion regulation difficulties to risky sexual behavior within a sample of patients in residential substance abuse treatment. *Addict Behav*. (2012) 37:1084–92. doi: 10.1016/j.addbeh.2012.05.001
60. Weiss NH, Forkus SR, Contractor AA, Darosh AG, Goncharenko S, Dixon-Gordon KL. Do difficulties regulating positive emotions contribute to risky sexual behavior? A path analysis. *Arch Sex Behav*. (2019) 48:2075–87. doi: 10.1007/s10508-019-1410-0
61. Abdel-Hamid M, Basilowski M, Schönfeld B, Bartels C, Anderson-Schmidt H, Hessmann P, et al. Sexual dysfunction in patients with adult attention deficit hyperactivity disorder: a pilot study. *Can J Hum Sex*. (2021) 30:106–13. doi: 10.3138/cjhs.2020-0036
62. Amani Jabalkandi S, Raisi F, Shahrivar Z, Mohammadi A, Meysamie A, Firoozikhojastefar R, et al. A study on sexual functioning in adults with attention-deficit/hyperactivity disorder. *Perspect Psychiatr Care*. (2020) 56:642–8. doi: 10.1111/ppc.12480
63. Briscoe-Smith AM, Hinshaw SP. Linkages between child abuse and attention-deficit/hyperactivity disorder in girls: behavioral and social correlates. *Child Abuse Negl*. (2006) 30:1239–55. doi: 10.1016/j.chiabu.2006.04.008
64. Margherio SM, Capps ER, Monopoli JW, Evans SW, Hernandez-Rodriguez M, Owens JS, et al. Romantic relationships and sexual behavior among adolescents with ADHD. *J Atten Disord*. (2021) 25:1466–78. doi: 10.1177/1087054720914371
65. Messman-Moore TL, Walsh KL, DiLillo D. Emotion dysregulation and risky sexual behavior in revictimization. *Child Abuse Negl*. (2010) 34:967–76. doi: 10.1016/j.chiabu.2010.06.004
66. Rahman Q, Xu Y, Lipka RA, Vasey PL. Prevalence of sexual orientation across 28 nations and its association with gender equality, economic development, and individualism. *Arch Sex Behav*. (2020) 49:595–606. doi: 10.1007/s10508-019-01590-0
67. Rucklidge JJ, Brown DL, Crawford S, Kaplan BJ. Retrospective reports of childhood trauma in adults with ADHD. *J Atten Disord*. (2006) 9:631–41. doi: 10.1177/1087054705283892
68. Wang J, Dey M, Soldati L, Weiss MG, Gmel G, Mohler-Kuo M. Psychiatric disorders, suicidality, and personality among young men by sexual orientation. *Eur Psychiatry*. (2014) 29:514–22. doi: 10.1016/j.eurpsy.2014.05.001
69. Babinski DE, Pelham WE Jr, Molina BS, Gnagy EM, Waschbusch DA, Yu J, et al. Late adolescent and young adult outcomes of girls diagnosed with ADHD in childhood: an exploratory investigation. *J Atten Disord*. (2011) 15:204–14. doi: 10.1177/1087054710361586
70. Canu WH, Carlson GL. Differences in heterosocial behavior and outcomes of ADHD-symptomatic subtypes in a college sample. *J Atten Disord*. (2003) 6:123–33. doi: 10.1177/108705470300600304
71. Halkett A, Hinshaw SP. Initial engagement in oral sex and sexual intercourse among adolescent girls with and without childhood attention-deficit/hyperactivity disorder. *Arch Sex Behav*. (2021) 50:181–90. doi: 10.1007/s10508-020-01733-8
72. Sarver DE, McCart MR, Sheidow AJ, Letourneau EJ. ADHD and risky sexual behavior in adolescents: conduct problems and substance use as mediators of risk. *J Child Psychol Psychiatry*. (2014) 55:1345–53. doi: 10.1111/jcpp.12249
73. Kafka MP, Prentky RA. Attention-deficit/hyperactivity disorder in males with paraphilias and paraphilia-related disorders: a comorbidity study. *J Clin Psychiatry*. (1998) 59:388–96. doi: 10.4088/jcp.v59n0709
74. Hall P. A biopsychosocial view of sex addiction. *Sex Relatsh Ther*. (2011) 26:217–28. doi: 10.1080/14681994.2011.628310
75. Karila L, Wery A, Weinstein A, Cottencin O, Petit A, Reynaud M, et al. Sexual addiction or hypersexual disorder: different terms for the same problem? A review of the literature. *Curr Pharm Des*. (2014) 20:4012–20. doi: 10.2174/13816128113199990619
76. Weinstein AM, Zolek R, Babkin A, Cohen K, Lejoyeux M. Factors predicting cybersex use and difficulties in forming intimate relationships among male and female users of cybersex. *Front Psych*. (2015) 6:54. doi: 10.3389/fpsy.2015.00054
77. Zapf JL, Greiner J, Carroll J. Attachment styles and male sex addiction. *Sex Addict Compuls*. (2008) 15:158–75. doi: 10.1080/10720160802035832
78. Privara M, Bob P. Pornography consumption and cognitive-affective distress. *J Nerv Ment*. (2023)
79. Zlot Y, Goldstein M, Cohen K, Weinstein A. Online dating is associated with sex addiction and social anxiety. *J Behav Addict*. (2018) 7:821–6. doi: 10.1556/2006.7.2018.66
80. Soldati L, Bianchi-Demicheli F, Schockaert P, Köhl J, Bolmont M, Hasler R, et al. Sexual function, sexual dysfunctions, and ADHD: a systematic literature review. *J Sex Med*. (2020) 17:1653–64. doi: 10.1016/j.jsxm.2020.03.019
81. Soldati L, Bianchi-Demicheli F, Schockaert P, Köhl J, Bolmont M, Hasler R, et al. Association of ADHD and hypersexuality and paraphilias. *Psychiatry Res*. (2021) 295:113638. doi: 10.1016/j.psychres.2020.113638
82. Hertz PG, Turner D, Barra S, Biedermann L, Retz-Junginger P, Schöttle D, et al. Sexuality in adults with ADHD: results of an online survey. *Front Psych*. (2022) 13:868278. doi: 10.3389/fpsy.2022.868278
83. Briken P, Matthiesen S, Pietras L, Wiessner C, Klein V, Reed GM, et al. Estimating the prevalence of sexual dysfunction using the new ICD-11 guidelines: results of the first representative, population-based German health and sexuality survey (GeSiD). *Dtsch Arztebl Int*. (2020) 117:653–8. doi: 10.3238/arztebl.2020.0653
84. Chen L, Yang Y, Su W, Zheng L, Ding C, Potenza MN. The relationship between sexual sensation seeking and problematic internet pornography use: a moderated mediation model examining roles of online sexual activities and the third-person effect. *J Behav Addict*. (2018) 7:565–73. doi: 10.1556/2006.7.2018.77
85. Hald GM, Mulya TW. Pornography consumption and non-marital sexual behaviour in a sample of young Indonesian university students. *Cult Health Sex*. (2013) 15:981–96. doi: 10.1080/13691058.2013.802013
86. Peter J, Valkenburg PM. Adolescents and pornography: a review of 20 years of research. *J Sex Res*. (2016) 53:509–31. doi: 10.1080/00224499.2016.1143441
87. Efrati Y, Gola M. Understanding and predicting profiles of compulsive sexual behavior among adolescents. *J Behav Addict*. (2018) 7:1004–14. doi: 10.1556/2006.7.2018.100
88. Štulhofer A, Rousseau A, Shekarchi R. A two-wave assessment of the structure and stability of self-reported problematic pornography use among male Croatian adolescents. *Int J Sex Health*. (2020) 32:151–64. doi: 10.1080/19317611.2020.1765940
89. Bóthe B, Tóth-Király I, Potenza MN, Orosz G, Demetrovics Z. High-frequency pornography use may not always be problematic. *J Sex Med*. (2020) 17:793–811. doi: 10.1016/j.jsxm.2020.01.007
90. Cooper AL, Delmonico DL, Griffin-Shelley E, Mathy RM. Online sexual activity: an examination of potentially problematic behaviors. *Sex Addict Compuls*. (2004) 11:129–43. doi: 10.1080/10720160490882642
91. Svedin CG, Åkerman I, Priebe G. Frequent users of pornography. A population based epidemiological study of Swedish male adolescents. *J Adolesc*. (2011) 34:779–88. doi: 10.1016/j.adolescence.2010.04.010
92. Vaillancourt-Morel MP, Bergeron S. Self-perceived problematic pornography use: beyond individual differences and religiosity. *Arch Sex Behav*. (2019) 48:437–41. doi: 10.1007/s10508-018-1292-6
93. Wordecha M, Wilk M, Kowalewska E, Skorko M, Łapiński A, Gola M. “Pornographic binges” as a key characteristic of males seeking treatment for compulsive sexual behaviors: qualitative and quantitative 10-week-long diary assessment. *J Behav Addict*. (2018) 7:433–44. doi: 10.1556/2006.7.2018.33
94. Grubbs JB, Hoagland KC, Lee BN, Grant JT, Davison P, Reid RC, et al. Sexual addiction 25 years on: a systematic and methodological review of empirical literature and an agenda for future research. *Clin Psychol Rev*. (2020) 82:101925. doi: 10.1016/j.cpr.2020.101925
95. Kühn S, Gallinat J. Brain structure and functional connectivity associated with pornography consumption: the brain on porn. *JAMA Psychiat*. (2014) 71:827–34. doi: 10.1001/jamapsychiatry.2014.93
96. Brand M, Young KS, Laier C, Wölfling K, Potenza MN. Integrating psychological and neurobiological considerations regarding the development and maintenance of specific internet-use disorders: an interaction of person-affect-cognition-execution (I-PACE) model. *Neurosci Biobehav Rev*. (2016) 71:252–66. doi: 10.1016/j.neubiorev.2016.08.033
97. Kafka MP, Hennen J. A DSM-IV Axis I comorbidity study of males (n = 120) with paraphilias and paraphilia-related disorders. *Sex Abuse*. (2002) 14:349–66. doi: 10.1177/107906320201400405
98. Solanto MV. Dopamine dysfunction in AD/HD: integrating clinical and basic neuroscience research. *Behav Brain Res*. (2002) 130:65–71. doi: 10.1016/s0166-4328(01)00431-4
99. Rømer Thomsen K, Callesen MB, Hesse M, Kvamme TL, Pedersen MM, Pedersen MU, et al. Impulsivity traits and addiction-related behaviors in youth. *J Behav Addict*. (2018) 7:317–30. doi: 10.1556/2006.7.2018.22
100. Bowlby J. *A secure base: clinical applications of attachment theory*. London: Routledge (1988).
101. Freeburg MN, Van Winkle JL. *Sexual compulsivity and gestalt therapy: a case study*. (2011). Available at: http://counselingoutfitters.com/vistas/vistas11/Article_58.pdf.
102. Griffin-Shelley E, Benjamin L, Benjamin R. Sex addiction and dissociation. *Sex Addict Compulsivity*. (1995) 2:295–306. doi: 10.1080/10720169508400090

103. Leedes R. The three most important criteria in diagnosing sexual addictions: obsession, obsession, and obsession. *Sex Addict Compulsivity*. (2001) 8:215–26. doi: 10.1080/107201601753459928
104. Schore AN. Effects of a secure attachment relationship on right brain development, affect regulation, and infant mental health. *Infant Ment Health J*. (2001) 22:7–66. doi: 10.1002/1097-0355(200101/04)22:1<7::AID-IMHJ2>3.0.CO;2-N
105. Schwartz MF. Reenactments related to bonding and hypersexuality. *Sex Addict Compulsivity*. (1996) 3:195–212. doi: 10.1080/10720169608400112
106. Biederman J, Newcorn J, Sprich S. Comorbidity of attention deficit hyperactivity disorder. *Am J Psychiatr*. (1991) 148:564–77. doi: 10.1176/ajp.148.5.564
107. MTA Cooperative Group. A 14-month randomized clinical trial of treatment strategies for attention-deficit/hyperactivity disorder. *Arch Gen Psychiatry*. (1999) 56:1073–86. doi: 10.1001/archpsyc.56.12.1073
108. Alves CDB, Cavalhieri KE. Self-perceived problematic pornography use: an integrative model from a research domain criteria and ecological perspective. *Sex Cult*. (2020) 24:1619–40. doi: 10.1007/s12119-019-09680-w
109. Beyens I, Vandenbosch L, Eggermont S. Early adolescent boys' exposure to internet pornography: relationships to pubertal timing, sensation seeking, and academic performance. *J Early Adolesc*. (2015) 35:1045–68. doi: 10.1177/0272431614548069
110. Cooper A, Delmonico DL, Burg R. Cybersex users, abusers, and compulsives: new findings and implications. *Sex Addict Compulsivity*. (2000) 7:5–29. doi: 10.1080/10720160008400205
111. Duffy A, Dawson DL, Das Nair R. Pornography addiction in adults: a systematic review of definitions and reported impact. *J Sex Med*. (2016) 13:760–77. doi: 10.1016/j.jsxm.2016.03.002
112. Grubbs JB, Volk F, Exline JJ, Pargament KI. Internet pornography use: perceived addiction, psychological distress, and the validation of a brief measure. *J Sex Marital Ther*. (2015) 41:83–106. doi: 10.1080/0092623X.2013.842192
113. Paul B. Predicting internet pornography use and arousal: the role of individual difference variables. *J Sex Res*. (2009) 46:344–57. doi: 10.1080/00224490902754152
114. Peter J, Valkenburg PM. Processes underlying the effects of adolescents' use of sexually explicit internet material: the role of perceived realism. *Commun Res*. (2010) 37:375–99. doi: 10.1177/0093650210362464
115. Ballester-Arnal R, Castro-Calvo J, Giménez-García C, Gil-Juliá B, Gil-Llario MD. Psychiatric comorbidity in compulsive sexual behavior disorder (CSBD). *Addict Behav*. (2020) 107:106384. doi: 10.1016/j.addbeh.2020.106384
116. Chiclana C, Contreras M, Carriles S, Rama D. Sexual addiction: independent entity or comorbid symptom. *Cuad Med Psicosom Psiquiatr Enlace*. (2015) 115:19–26.
117. Kraus SW, Potenza MN, Martino S, Grant JE. Examining the psychometric properties of the Yale–Brown obsessive–compulsive scale in a sample of compulsive pornography users. *Compr Psychiatry*. (2015) 59:117–22. doi: 10.1016/j.comppsy.2015.02.007
118. Perry SL. Pornography use and depressive symptoms: examining the role of moral incongruence. *Soc Ment Health*. (2018) 8:195–213. doi: 10.1177/2156869317728373
119. Shirk SD, Saxena A, Park D, Kraus SW. Predicting problematic pornography use among male returning US veterans. *Addict Behav*. (2021) 112:106647. doi: 10.1016/j.addbeh.2020.106647
120. Whitfield TH, Rendina HJ, Grov C, Parsons JT. Viewing sexually explicit media and its association with mental health among gay and bisexual men across the US. *Arch Sex Behav*. (2018) 47:1163–72. doi: 10.1007/s10508-017-1045-y
121. Fuss J, Briken P, Stein DJ, Lochner C. Compulsive sexual behavior disorder in obsessive–compulsive disorder: prevalence and associated comorbidity. *J Behav Addict*. (2019) 8:242–8. doi: 10.1556/2006.8.2019.23
122. Cervigón-Carrasco V, Ballester-Arnal R, Giménez-García C. Cognitive processes related to problematic pornography use (PPU): a systematic review of experimental studies. *Addict Behav Rep*. (2021) 13:100345. doi: 10.1016/j.abrep.2021.100345
123. Kraus SW, Krueger RB, Briken P, First MB, Stein DJ, Kaplan MS, et al. Compulsive sexual behaviour disorder in the ICD-11. *World Psychiatry*. (2018) 17:109–10. doi: 10.1002/wps.20499
124. Mead D, Sharpe M. Pornography and sexuality research papers at the 5th international conference on behavioral addictions. *Sex Addict Compuls*. (2018) 25:248–68. doi: 10.1080/10720162.2019.1578312
125. Reid RC, Carpenter BN, Hook JN, Garos S, Manning JC, Gilliland R, et al. Report of findings in a DSM-5 field trial for hypersexual disorder. *J Sex Med*. (2012) 9:2868–77. doi: 10.1111/j.1743-6109.2012.02936.x
126. Wéry A, Billieux J. Problematic cybersex: conceptualization, assessment, and treatment. *Addict Behav*. (2017) 64:238–46. doi: 10.1016/j.addbeh.2015.11.007
127. Allely CS. Case report: autism spectrum disorder symptomatology and child pornography. *J Intellect Disabil Offend Behav*. (2020) 11:171–89. doi: 10.1108/JIDOB-11-2019-0026
128. Bőthe B, Tóth-Király I, Griffiths MD, Potenza MN, Orosz G, Demetrovics Z. Are sexual functioning problems associated with frequent pornography use and/or problematic pornography use? Results from a large community survey including males and females. *Addict Behav*. (2021) 112:106603. doi: 10.1016/j.addbeh.2020.106603
129. Fernandez DP, Kuss DJ, Griffiths MD. The pornography “rebooting” experience: a qualitative analysis of abstinence journals on an online pornography abstinence forum. *Arch Sex Behav*. (2021) 50:711–28. doi: 10.1007/s10508-020-01858-w
130. Foubert JD. The public health harms of pornography: the brain, erectile dysfunction, and sexual violence. *Dignity*. (2017) 2:6. doi: 10.23860/dignity.2017.02.03.06
131. Park BY, Wilson G, Berger J, Christman M, Reina B, Bishop F, et al. Is internet pornography causing sexual dysfunctions? A review with clinical reports. *Behav Sci*. (2016) 6:17. doi: 10.3390/bs6030017
132. White C. Internet pornography: addiction or sexual dysfunction? In: PA Brough and M Denman, editors. *Introduction to psychosexual medicine*. Boca Raton, FL: CRC Press (2019). 189–204.
133. Ford JJ, Durtschi JA, Franklin DL. Structural therapy with a couple battling pornography addiction. *Am J Fam Ther*. (2012) 40:336–48. doi: 10.1080/01926187.2012.685003
134. Lewczuk K, Szmyd J, Skorko M, Gola M. Treatment seeking for problematic pornography use among women. *J Behav Addict*. (2017) 6:445–56. doi: 10.1556/2006.6.2017.063
135. World Health Organization. *International statistical classification of diseases and related health problems*. 11th ed. Geneva: World Health Organization (2019).
136. Fernandez DP, Griffiths MD. Psychometric instruments for problematic pornography use: a systematic review. *Eval Health Prof*. (2021) 44:111–41. doi: 10.1177/0163278719861688
137. Dhuffar MK, Griffiths MD. A systematic review of online sex addiction and clinical treatments using CONSORT evaluation. *Curr Addict Rep*. (2015) 2:163–74. doi: 10.1007/s40429-015-0055-x
138. Garcia FD, Assumpção AA, Malloy-diniz L, De Freitas AAC, Delavenne H, Thibaut F. A comprehensive review of psychotherapeutic treatment of sexual addiction. *J Groups Addict Recover*. (2016) 11:59–71. doi: 10.1080/1556035X.2015.1066726
139. Hook JN, Reid RC, Penberthy JK, Davis DE, Jennings DJ. Methodological review of treatments for nonparaphilic hypersexual behavior. *J Sex Marital Ther*. (2014) 40:294–308. doi: 10.1080/0092623X.2012.751075
140. Kaplan MS, Krueger RB. Diagnosis, assessment, and treatment of hypersexuality. *J Sex Res*. (2010) 47:181–98. doi: 10.1080/00224491003592863
141. Naficy H, Samenow CP, Fong TW. A review of pharmacological treatments for hypersexual disorder. *Sex Addict Compuls*. (2013) 20:139–53. doi: 10.1080/10720162.2013.769843
142. Sniewski L, Farvid P, Carter P. The assessment and treatment of adult heterosexual men with self-perceived problematic pornography use: a review. *Addict Behav*. (2018) 77:217–24. doi: 10.1016/j.addbeh.2017.10.010
143. Von Franqué F, Klein V, Briken P. Which techniques are used in psychotherapeutic interventions for nonparaphilic hypersexual behavior? *Sex Med Rev*. (2015) 3:3–10. doi: 10.1002/smrj.34
144. Solanto MV, Abikoff H, Sonuga-Barke E, Schachar R, Logan GD, Wigal T, et al. The ecological validity of delay aversion and response inhibition as measures of impulsivity in AD/HD: a supplement to the NIMH multimodal treatment study of AD/HD. *J Abnorm Child Psychol*. (2001) 29:215–28. doi: 10.1023/a:1010329714819
145. Sonuga-Barke EJ. The dual pathway model of AD/HD: an elaboration of neurodevelopmental characteristics. *Neurosci Biobehav Rev*. (2003) 27:593–604. doi: 10.1016/j.neubiorev.2003.08.005
146. Rubia K, Alegria AA, Brinson H. Brain abnormalities in attention-deficit hyperactivity disorder: a review. *Rev Neurol*. (2014) 58:S3–S16.
147. Guerrero MD, Barnes JD, Walsh JJ, Chaput JP, Tremblay MS, Goldfield GS. 24-hour movement behaviors and impulsivity. *Pediatrics*. (2019) 144:e20190187. doi: 10.1542/peds.2019-0187
148. American Psychiatric Association. *Diagnostic and statistical manual of mental disorders*. 5th ed. Washington, DC: American Psychiatric Publishing Inc. (2013).
149. Bőthe B, Vaillancourt-Morel MP, Bergeron S, Demetrovics Z. Problematic and non-problematic pornography use among LGBTQ adolescents: a systematic literature review. *Curr Addict Rep*. (2019) 6:478–94. doi: 10.1007/s40429-019-00289-5
150. Bőthe B, Tóth-Király I, Demetrovics Z, Orosz G. The short version of the problematic pornography consumption scale (PPCS-6): a reliable and valid measure in general and treatment-seeking populations. *J Sex Res*. (2021) 58:342–52. doi: 10.1080/00224499.2020.1716205
151. Chen L, Jiang X, Wang Q, Bőthe B, Potenza MN, Wu H. The association between the quantity and severity of pornography use: a meta-analysis. *J Sex Res*. (2022) 59:704–19. doi: 10.1080/00224499.2021.1988500
152. Kraus SW, Voon V, Potenza MN. Should compulsive sexual behavior be considered an addiction? *Addiction*. (2016) 111:2097–106. doi: 10.1111/add.13297
153. Noll JG, Shenk CE, Barnes JE, Haralson KJ. Association of maltreatment with high-risk internet behaviors and offline encounters. *Pediatrics*. (2013) 131:e510–7. doi: 10.1080/00224499.2016.1143441