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FULL-LENGTH REPORT

# Clinical characteristics associated with problematic pornography use among individuals seeking treatment for opioid use disorder

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## ABSTRACT

*Background and Aims:* Many jurisdictions are experiencing opioid epidemics. Opioid use disorder (OUD) often co-occurs with other psychiatric disorders including behavioral addictions like gambling disorder. However, little is known regarding the frequency and correlates of problematic pornography use (PPU) among people seeking treatment for OUD. Here we aimed to investigate PPU and its correlates in people seeking OUD treatment. *Method:* From October 2018 to March 2020, 1,272 individuals seeking OUD treatment were screened for PPU by completing the Brief Pornography Screen (BPS), a 5-item instrument validated for assessing PPU. Self-reported data were used. *Results:* Among the sample there were 707 (60%) males and 565 (40%) females. The mean age of participants was 37.9 ± 10.5 years (range 18–73), there were 707 (60%) males and 565 (40%) females, 9.9% ($n$ = 126) exhibited low positive BPS scores ($1 \leq$ score $< 4$), and 4.5% of the sample ($n$ = 57) screened positive for PPU (BPS score ≥4). Individuals screening positive for PPU versus negative were mostly male (77%), scored higher on measures of impulsivity in the domains of positive urgency, negative urgency, and sensation-seeking and demonstrated more psychopathology on measures of substance use, psychotic symptoms, emotional lability, depression/functioning and self-harm. *Discussion and Conclusion:* A minority of individuals seeking treatment for OUD screened positive for PPU. Among individuals with OUD, those screening positive (versus negative) for PPU were more impulsive and experienced more psychiatric symptoms, suggesting the need for additional investigation and screening for and addressing PPU in people with OUD.

## KEYWORDS

addictive behaviors, pornography, opioid use disorder, compulsive behaviors, impulsive behaviors, compulsive sexual behavior disorder

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## INTRODUCTION

Opioid use disorder (OUD) often co-occurs with other psychiatric concerns, including addictive disorders and behaviors like gambling disorder (GD) and problematic use of the internet (Baroni, Marazziti, Mucci, Diadema, & Dell'Osso, 2019; Castrén, Salonen, Alho, Lahti, & Simojoki, 2015; Gorzelańczyk, Walecki, Błaszczyszyn, Laskowska, & Kawala-Sterniuk, 2021; Himelhoch et al., 2016). Certain factors relevant to OUD (e.g., high levels of pain interference) may link OUD and behavioral addictions (Barry, Pilver, Hoff, & Potenza, 2013). However, little is known regarding the frequency and correlates of problematic pornography use (PPU) among people seeking treatment for OUD.

Estimates of pornography consumption in the general population have varied. Recent research suggests that the lifetime prevalence of pornography consumption is approximately 92–98% in men and 50–91% in women (Ballester-Arnal, Castro-Calvo, García-Barba, Ruiz-Palomino, & Gil-Llario, 2021; Dalooyi, Sharbaaf, Abdekhodaei, & Chamanabad, 2023). Some recent data estimates that 46% of men and 16% of women report pornography use within the past week (Grubbs, Kraus, & Perry, 2019), with most considering pornography use a recreational activity. Nevertheless, recent data estimate that between 0.8% and 38% of individuals exhibit PPU or related features or concerns (Ballester-Arnal, Castro Calvo, Gil-Llario, & Gil-Julia, 2017; Bőthe et al., 2024; Bőthe, Tóth-Király, Potenza, Orosz, & Demetrovics, 2020; Ross, Månsson, & Daneback, 2012).

There is considerable debate about how best to classify PPU. PPU is not formally recognized in the DSM-5 (American Psychiatric Association & Association, 2013). It has at times been viewed as a subtype of Hypersexual Disorder (HD) (Kafka, 2010) or a form of Sexual Addiction (SA) (Rosenberg, Carnes, & O'Connor, 2014), or a manifestation of Compulsive Sexual Behavior Disorder (CSBD) (Kraus et al., 2018). In other words, some have considered PPU a subtype of SA, HD, or CSBD rather than an independent clinical condition (Castro-Calvo, Cervigón-Carrasco, Ballester-Arnal, & Giménez-García, 2021; Gola et al., 2022).

Some neurobiological data and clinical proposals suggest that PPU may represent an independent behavioral addiction (Brand et al., 2022; Gola et al., 2017). However, the existence of "pornography addiction" as a clinical disorder remains controversial, and the clinical profile is debatable (Ince, Yücel, Albertella, & Fontenelle, 2021), and there are no established diagnostic criteria or recommended treatment guidelines for pornography addiction (Duffy, Dawson, & Das Nair, 2016).

Individuals with substance use disorders (SUDs) may be vulnerable to developing PPU in part due to shared neurocognitive mechanisms, including those linked to impulsivity (Gola et al., 2017; Mestre-Bach, Fernández-Aranda, Jiménez-Murcia, & Potenza, 2020; Stark, Klucken, Potenza, Brand, & Strahler, 2018). Mental health concerns may also relate to PPU, as individuals may use pornography to escape psychological distress (Borgogna, Duncan, & McDermott, 2018). Studies of OUD have identified certain genetic variants that influence susceptibility, including genetic markers related to dopamine systems that are involved in reward and impulse control processing (Mistry, Bawor, Desai, C Marsh, & Samaan, 2014). PPU, while less well studied, may also involve biological mechanisms influencing the brain's reward system (Stark et al., 2018). Some research suggests that individuals with certain genetic predispositions may be more prone to developing behavioral addictions, due to the fact that behavioral addictions follow the same rewards patterns as substance use, and are associated with craving, tolerance, relapse, and withdrawal (Popescu, Marian, Drãgoi, & Costea, 2021). Individuals with behavioral addictions often display a problematic engagement pattern characterized by impaired control, cravings, unsuccessful attempts to reduce the behavior, impairment, limited interests in other activities, and continuing engagement despite negative consequences. Whether PPU exhibits other features criteria of addictions, such as tolerance and withdrawal, remains a subject of debate (Blum, Badgaiyan, & Gold, 2015; Chamberlain et al., 2016; Duffy et al., 2016).

Little data exist on the clinical characteristics of PPU in people seeking treatment for SUDs (Tadpatrikar & Sharma, 2018). Among other populations, PPU has been linked to impulsivity, poor mental health, and multiple other concerns (Kor et al., 2014). The extent to which PPU is prevalent among individuals with OUD and whether it may be linked to similar negative measures should be investigated. This is important for several reasons. 1) PPU has been proposed as a behavioral addiction. Individuals with OUD demonstrate frequent co-occurring behavioral addictions like gambling disorder, although this is not well known for PPU (thus, one need for the current study). Pornography use has been proposed to substitute for substance use in substance addictions (Tadpatrikar & Sharma, 2018). Factors such as impulsivity, sensation seeking, and difficulty in emotion regulation are common across both substance and behavioral addictions. 2) People with OUD may experience significant psychosocial stressors including loneliness, social isolation, and mental health issues including depression, anxiety, and posttraumatic stress disorder (Bernardy & Montaño, 2019; Christie, 2021; Dahlby & Kerr, 2020; Hendy, Black, Can, Fleischut, & Aksen, 2018; McDonagh, Williams, Oldfield, Cruz-Jose, & Olson, 2020). These stressors may increase the likelihood of using PPU as a potentially maladaptive emotion-regulation strategy to reduce aversive thoughts, feelings, or sensations (Privara & Bob, 2023; Wéry, Schimmenti, Karila, & Billieux, 2019). 3) Both OUD and PPU may involve maladaptive cognitive and behavioral patterns with individuals exhibiting compulsive behaviors, poor control, and continued engagement in the behavior despite adverse consequences (Pergolizzi Jr, Raffa, & Rosenblatt, 2020; Rousseau, Bőthe, & Štulhofer, 2021). 4) PPU may negatively impact the recovery process for individuals with OUD because it could serve as a trigger for substance use or relapse due to the associated emotional distress and the use of pornography as a substitute for drug use

(Tadpatrikar & Sharma, 2018). Further, understanding the factors that may link to PPU among people with OUD may help identify those individuals and prevent negative impacts related to continuing or escalating PPU.

The current study aimed to fill gaps in knowledge about the frequency, correlates, and clinical implications of PPU within individuals seeking treatment for OUD, advance understanding of OUD and PPU, and inform intervention approaches. Findings from our study may have implications for healthcare policy initiatives, clinical practice, and support programs, as well as be helpful for professional training programs targeted toward the diverse needs of individuals with co-occurring OUD and PPU. Given that PPU and GD may both be considered within behavioral-addiction frameworks, we hypothesized that PPU would positively associate with male sex, psychiatric distress, and impulsivity.

## METHOD

### Participants

Data were collected from a consecutive sample of 1,324 individuals with OUD who presented for treatment at the APT Foundation, headquartered in New Haven, Connecticut. The APT Foundation specializes in SUD treatment and also provides primary care, psychiatric, counseling, and vocational services (Madden et al., 2018). From October 2018 to March 2020, of 1,324 individuals seeking OUD treatment, 1,272 individuals were screened for PPU and included in analyses. The APT Foundation Board of Directors and the Human Investigations Committee of the Yale School of Medicine approved the study. The questionnaires were part of a packet that participants completed onsite at intake. Before meeting with the medical provider, participants were offered a clip board with paperwork, which also included the study questionnaire. Patients completed the questionnaire prior to the meeting with clinicians/providers. The completion of the questionnaire was general understood as an assumption of the consent to participate in the study. Out of 1,324 individuals completed the intake, and 52 individuals were excluded from the analysis due to missing data on the BPS measure.

### Assessment

*The Brief Pornography Screen (BPS)* (Kraus et al., 2020), a 5-item instrument for identifying probable PPU, has been validated in clinical and non-clinical samples (Bőthe et al., 2024; Kraus et al., 2020). Item scores range from 0 to 2 (0 = never, 1 = sometimes, 2 = frequently) with total scores ranging from 0 to 10 and higher scores reflecting greater severity. Scores ≥4 were considered positive for past-6-month PPU (Kraus et al., 2020). Scores ≥1 indicated some symptoms of PPU. In the present study, the Cronbach's alpha was 0.82.

*The Urgency-Premeditation-Perseverance-Sensation Seeking-Positive Urgency scale (UPPS-P)* (Cyders, Littlefield, Coffey, & Karyadi, 2014) includes 20 items rated on a 4-point scales: 1 = strongly agree to 4 = strongly disagree. The questionnaire evaluates five dimensions of impulsive tendencies with four items per dimension: positive urgency (acting rashly when experiencing intense positive moods), negative urgency (acting rashly when experiencing intense negative moods), lack of perseverance (difficulties completing tasks that may be long, boring, or difficult), lack of premeditation (not considering consequences of one's actions), and sensation-seeking (pursuing novel and thrilling experiences). The minimum score of each subscale is 4 and the maximum is 16. Higher scores reflect greater impulsivity. In the present study, Cronbach's alpha values for negative urgency, positive urgency, sensation-seeking, lack of perseverance, and lack of premeditation were 0.80, 0.81, 0.70, 0.69, and 0.77, respectively. Given that lack of perseverance showed a Cronbach's alpha less than 0.7, it was excluded from subsequent analyses.

*The Behavioral and Symptom Identification Scale (BASIS-24)* (Cameron et al., 2007) is a self-report measure including 24 items (scored on a 0–4 scale with response options indicating the level of severity or frequency of occurrence during the past week) designed to assess psychiatric symptoms across 6 domains: depression (6 items), interpersonal relationships (5 items), self-harm (2 items), emotional lability (3 items), psychotic symptoms (4 items), and substance abuse (4 items). Past-week suicidal thoughts are measured by a single question from the BASIS-24 Scale: "During the past week, how much of the time did you think about ending your life?" The answer was categorized as "yes" if the individual's response positively indicated such thoughts occurred a little of the time, half of the time, most of the time, or all of the time. In the present study, Cronbach's alpha values for depression, interpersonal relationships, self-harm, emotional lability, psychotic symptoms, and substance abuse domains were 0.82, 0.78, 0.77, 0.80, 0.86 and 0.88, respectively.

### Statistical analyses

Data analyses proceeded in two steps. First, total sample characteristics were presented, and percentages and means were calculated for the full sample. Second, respondent sociodemographic characteristics and clinical measures were summarized and compared across the groups using chi-square, independent-samples *t*-test and general linear modeling (GLM) procedures (Lee, 1987). Frequencies (n) and percentages (%) for categorical and means (m) and standard deviations (SDs) for continuous variables were reported. Second, linear regression analyses were used to examine associations between the groups in regard to clinical variables. Cohen's *d* values were calculated as effect sizes to estimate standardized differences between means for continuous measures. All analyses were conducted using SAS 9.4 statistical software. To minimize Type I error and adjust significance level for multiple comparison, Bonferroni correction was applied. Statistical significance was set at the 0.005 level.

## Ethics

The APT Foundation Board of Directors and the Human Investigations Committee of the Yale School of Medicine approved the study. All participants provided informed consent.

# RESULTS

## Descriptive statistics

The sample ($n$ = 1,272) was relatively young (mean age = 37.9 ± 10.5 years; range 18–73), predominantly male (60%; $n$ = 707) and White (77.6%; $n$ = 907). A minority reported Hispanic ethnicity (11.5%; $n$ = 131), being married (12.7%; $n$ = 146), and a majority reported having at least a high-school education (57.1%; $n$ = 664). Approximately one-tenth of the total sample (9.9%; $n$ = 126) scored 1–3 on the BPS, and 4.5% ($n$ = 57) scored ≥4, screening positive for PPU (PPU+).

Among the PPU+ group, most individuals (70%) noted that they sometimes used pornography more than they had wanted and 25% said that they had done so frequently; 65% sometimes and 21% frequently used pornography to cope with strong emotions like sadness, anger, or loneliness; 60% sometimes and 28% frequently attempted to cut back or stop use of pornography but were unsuccessful, 58% sometimes and 23% frequently found it difficult to resist, and 58% sometimes continued to use pornography despite feeling guilty about it, with 14% of respondents having done so frequently. Figure 1 presents data on the endorsed BPS items for the PPU+ group.

## Bivariate and multivariate analyses

Table 1 presents results of descriptive analyses of socio-demographic characteristics. stratified by PPU status.

Table 2 presents associations between clinical and functioning variables and group membership, adjusting for sex. PPU+ versus PPU- status was linked to higher impulsivity in the domains of positive urgency, negative urgency, and sensation-seeking, with $0.56 \leq d \leq 0.83$. Additionally, PPU+ was linked to greater psychopathology (total BASIC-24 scores), specifically on alcohol/drug use, psychotic symptoms, and self-harm subscales with $p < 0.0001$, depression/functioning ($p = 0.0001$), and emotional lability ($p = 0.0004$), with largest effects observed for psychotic symptoms ($d = 1.01$).

*Table 1.* Sociodemographic characteristics

| Variable | PPU- $n$ = 1,215; 95.5% | | PPU+ $n$ = 57; 4.5% | |
|---|---|---|---|---|
| | mean | SD | mean | SD |
| ***Age (years)*** | 37.71 | 10.5 | 39.31 | 8.47 |
| | **n** | **%** | **n** | **%** |
| ***Gender*** | | | | |
| Male vs Female | 667 | 59.61 | 40 | 76.92 |
| ***Race*** | | | | |
| White vs not White | 873 | 78.23 | 34 | 65.38 |
| ***Ethnicity*** | | | | |
| Hispanic vs not Hispanic | 120 | 10.98 | 11 | 22.00 |
| ***Marital status*** | | | | |
| Married vs not Married | 137 | 12.44 | 9 | 17.31 |
| ***Education*** | | | | |
| College/college graduate vs Elementary/Middle/High school | 482 | 43.38 | 17 | 32.69 |

SD = standard deviation.

# DISCUSSION

This is the first study to our knowledge that has investigated the frequency and correlates of PPU in individuals seeking treatment for OUD. Approximately one-tenth of individuals seeking treatment for OUD (9.9%) scored between 1 and 3 points on the BPS, indicating some possible concerns regarding use of pornography. Additionally, 4.5% of participants reported experiencing PPU which suggests that a small but notable proportion of individual within this population may be struggling with compulsive patterns of

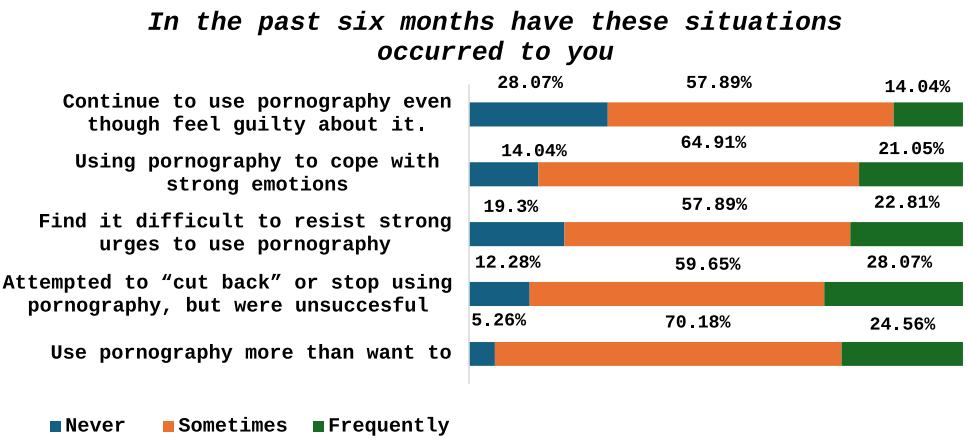


*Fig. 1.* Brief pornography screen item responses in the PPU+ group

*Table 2.* Psychiatric and impulsivity measures

| Variable | PPU- $n$ = 1,215; 95.5% | | PPU+ $n$ = 57; 4.5% | | Statistical Test | | |
|---|---|---|---|---|---|---|---|
| | mean | SD | mean | SD | $t$ | $p$ | Cohen's $d$ |
| ***BASIS-24*** | | | | | | | |
| Alcohol/Drug Use | 2.19 | 1.06 | 2.79 | 0.75 | 4.02 | <0.0001 | **0.65** |
| Psychotic symptoms | 0.60 | 0.58 | 1.34 | 0.85 | 8.76 | <0.0001 | **1.01** |
| Emotional lability | 1.69 | 1.12 | 2.25 | 1.11 | 3.52 | 0.0004 | **0.50** |
| Interpersonal relationships | 2.31 | 0.94 | 2.09 | 0.74 | −1.65 | 0.0994 | −0.02 |
| Depression/Functioning | 1.23 | 0.84 | 1.68 | 0.84 | 3.80 | 0.0001 | **0.54** |
| Self-harm | 1.08 | 0.80 | 1.67 | 0.73 | 5.27 | <0.0001 | **0.78** |
| ***UPPS-P*** | | | | | | | |
| Positive Urgency | 7.85 | 3.09 | 10.33 | 2.87 | 5.84 | <0.0001 | **0.83** |
| Negative Urgency | 10.09 | 3.20 | 11.81 | 2.69 | 3.89 | 0.0001 | **0.58** |
| Sensation-seeking | 9.52 | 3.07 | 11.21 | 2.94 | 3.93 | <0.0001 | **0.56** |
| Lack of Premeditation | 7.93 | 2.48 | 8.04 | 2.67 | 0.30 | 0.7675 | 0.04 |
| Lack of Perseverance | 7.48 | 2.21 | 7.71 | 2.68 | 0.73 | 0.4649 | 0.09 |

Bolded are significant differences.
SD = standard deviation.

pornography use. Although the frequency of PPU in this sample is lower than reported in some previous studies of the general population (e.g., 16.6% (Bőthe et al., 2024)), our study identifies significant concerning correlates (aspects of psychopathology, impulsivity) of PPU in individuals with OUD. Implications are discussed below.

Our hypotheses were partially supported. Individuals with PPU were more likely to be male. The male predominance resonates with prior findings that men are more likely to use pornography and experience PPU (Bőthe et al., 2024; Hernández-Mora Ruiz Del Castillo, Bonnet, & Varescon, 2023). The current findings extend understanding to individuals with OUD.

With respect to the behavioral and symptom identification (BASIS-24) scale, individuals who screened positive for PPU were more likely to exhibit psychotic symptoms, emotional lability, self-harm, depression/functioning, and alcohol/drug use. The current findings resonate with and extend findings regarding PPU and other behavioral addictions with respect to psychiatric symptomatology. For example, GD frequently co-occurs with a broad range of psychiatric conditions including affective, impulse control, substance use and psychotic disorders (Desai & Potenza, 2009; Fortgang, Hoff, & Potenza, 2018; Potenza et al., 2019). Other studies have linked PPU to lower self-esteem (Leppink, Chamberlain, Redden, & Grant, 2016) and elevated levels of anxiety and depression. However, it remains unclear whether these conditions stem from pre-existing issues or from PPU. Further, the PPU+ group was characterized by a high level of impulsivity in three domains: positive urgency, negative urgency, and sensation-seeking. Prior work has found PPU+ associated with negative and positive urgency (Kraus et al., 2020). This finding corroborates other research data that suggest addictive behaviors associate with elevated impulsivity and that addictive disorders are characterized by high levels of impulsivity that may reflect difficulties in inhibitory control over urges (Ioannidis, Hook, Wickham, Grant, & Chamberlain, 2019; Rømer Thomsen et al., 2018).

Other studies have linked PPU to psychological distress and psychiatric symptomatology involving impulsivity, anxiety, post-traumatic stress disorder, and SUDs, particularly to alcohol (Borgogna et al., 2018; Borgogna, Kraus, & Grubbs, 2021; Moisson et al., 2019; Shirk, Saxena, Park, & Kraus, 2021). Pornography use has been associated with depression and anxiety (Guidry, Floyd, Volk, & Moen, 2020; Perry, 2018; Willoughby, Busby, & Young-Petersen, 2019), although the precise nature of the relationship remains incompletely understood. Some individuals may also use pornography to relieve feelings of loneliness (Butler, Pereyra, Draper, Leonhardt, & Skinner, 2018), boredom (Moynihan, Igou, & van Tilburg, 2022), or low self-esteem (Duffy et al., 2016) or use pornography as a substitute for substance use (Tadpatrikar & Sharma, 2018).

An important finding was the relatively low frequency of PPU as compared to estimates in the general population. This finding contrasts with GD that has been reported to be exhibited considerably more frequently in OUD relative to general populations (Himelhoch et al., 2016). This finding may reflect several possibilities. First, opioids tend to be sedating, and drugs with stimulating effects (e.g., methamphetamines) have been linked to sexual behaviors. Second, it is possible that for a portion of individuals with OUD that opioids fill needs that overlap with those for using pornography, mitigating against PPU. Third, it is possible that distinct mechanisms (e.g., neural) underlie OUD and PPU (Hayes, Herlinger, Paterson, & Lingford-Hughes, 2020; Herlinger & Lingford-Hughes, 2022). These and other possibilities warrant further investigation.

Several study limitations are noteworthy. First, we analyzed patients from a single treatment center; thus, the results may not generalize to other OUD populations and

settings. Second, the cross-sectional study design precludes understanding the direction of the associations or causality. Additional longitudinal investigations are needed to evaluate PPU in people with OUD and vice versa. Third, PPU was assessed via self-report with related biases associated with reliability on memory, honesty, social desirability, stigma, and shame warranting consideration. Fourth, the nature of the relationship between PPU and drug use was not assessed. Thus, the extent to which pornography use related in timing or frequency to opioid or other drug use could not be determined and could represent potential confounding factors. This limitation may be particularly relevant in the context of the ICD-11 descriptions of boundaries related to substance use for disorders due to addictive behaviors. Fifth, the sample was relatively large while the frequency of PPU was relatively low, which might lead to Type 1 error. Additionally, the use of a stringent Bonferroni correction may have made some clinically relevant relationships statistically non-significant. However, the exploratory nature of the study identified multiple clinically relevant factors linked to PPU in the clinical sample of people with OUD. Future studies should expand upon these initial findings to explore mechanisms and treatment implications directly.

In conclusion, our study provides valuable insights into the correlates of PPU among individuals seeking treatment for OUD. Individuals seeking treatment for OUD exhibited a relatively low frequency of PPU. Among individuals with OUD, those with PPU were more impulsive and exhibited more psychiatric symptomatology compared to those without PPU. The nature of these relationships (e.g., with respect to other clinically relevant variables including treatment outcome) warrants additional investigation. Considering links between PPU and psychiatric comorbidity and impulsivity, developing transdiagnostic approaches for the treatment of individuals with OUD are warranted. The current findings may inform future research and the screening, prevention, and treatment of PPU among people with OUD.

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*Authors' contribution:* EAS conceptualization, methodology, data curation, formal analysis, writing – original draft; SWK methodology, writing – review & editing; LMM writing – review & editing; SF writing – review & editing; EC writing – review & editing; MNP conceptualization, methodology, project administration, supervision, writing – review & editing; DB conceptualization, methodology, project administration, supervision, writing – review & editing. All authors have approved the final version of the manuscript.

*Conflict of interest:* The authors have no conflicts of interest to report. MNP discloses the following. MNP has consulted for Opiant Therapeutics, Game Day Data, Boehringer Ingelheim and Idorsia Pharmaceuticals; has been involved in a patent application with Yale University and Novartis; has received research support from Mohegan Sun Casino, Children and Screens and the Connecticut Council on Problem Gambling; has participated in surveys, mailings or telephone consultations related to drug addiction, impulse-control disorders or other health topics; has consulted for and/or advised gambling and legal entities and non-profit organizations on issues related to impulse control, internet use and addictive disorders; has performed grant reviews for research-funding agencies; has edited journals and journal sections; has given academic lectures in grand rounds, CME events and other clinical or scientific venues; and has generated books or book chapters for publishers of mental health texts. MNP is an Associate Editor of the Journal of Behavioral Addictions.

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