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BRIEF REPORT

Validation of the Problematic Pornography Consumption Scale: Short Form (PPCS-6) in a Spanish Clinical Population with Gambling Disorder

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Abstract

The prevalence of problematic pornography use (PPU) and its potential negative effects have raised concerns, necessitating the availability of accurate assessment tools. This study aimed to validate the Problematic Pornography Consumption Scale (PPCS-6) in a Spanish sample with gambling disorder. The sample consisted of 359 adults (92.2% men, $M = 39.5$ years, $SD = 13.6$) seeking treatment for gambling disorder. Other than the PPCS-6, various psychometrically sound instruments were used to assess variables related to PPU, gambling behavior, psychopathology, emotional dysregulation, impulsivity, and personality features. Confirmatory factor analysis and correlation coefficients were used for data analysis to examine the factor structure and assess convergent-discriminative validity of the PPCS-6. The psychometric properties of the PPCS-6 were supported in the present treatment-seeking population, showing a one-dimensional solution with good fit and internal consistency. Higher PPCS-6 scores were associated with more severe psychopathology, higher impulsivity, more emotion regulation difficulties, and lower self-directedness. Additionally, positive correlations were observed between PPCS-6 scores and specific motivations for using pornography. This study validates the Spanish version of the PPCS-6 as a reliable screening tool for assessing PPU in clinical populations, specifically in individuals with gambling disorder.

Keywords Problematic pornography use · Gambling disorder · Addictive behaviors · Compulsive behaviors · Emotion regulation · Impulsive behaviors

Introduction

The accessibility and consumption of pornography have recently increased due to technological advancements and its widespread availability on the internet (Lewczuk et al., 2021). In some cases, the use of pornography can become problematic, leading to negative consequences in various areas of an individual's life, including personal relationships, work or academic performance, and mental health (Brand et al., 2011; Camilleri et al., 2021). Thus, concerns have been raised about its potential negative effects (Dwulit & Rzymski, 2019; Goh et al., 2023; Park et al., 2016). However, determining the precise prevalence of problematic pornography use (PPU) is challenging due to varying definitions and assessment methods across studies (Grubbs et al., 2023).

PPU is characterized by compulsive consumption of sexually explicit materials, resulting in adverse effects on an individual's life and unsuccessful endeavors to reduce or stop such behavior (Bőthe et al., 2021a, 2021b, 2021c; Chen et al., 2022; Efrati & Gola, 2018). Although PPU is not currently recognized as an independent diagnostic entity, it has been included as one of the most common manifestations of compulsive sexual behavior disorder (CSBD) (Brand et al., 2022, 2025), recognized as a mental disorder in the International

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Classification of Diseases 11th Revision (ICD-11; WHO, 2022). However, given the unique clinical characteristics of PPU, it is important to validate suitable assessment tools for evaluating PPU.

Several instruments have been developed to assess PPU (Fernandez & Griffiths, 2021), among which the Problematic Pornography Consumption Scale (PPCS; Bőthe et al., 2018, 2019) stands out as one of the most widely used in both research and clinical settings. Moreover, the PPCS is one of the only measures that has been validated globally and showed strong psychometric properties across diverse populations (Bőthe et al., 2024). It is a self-report questionnaire designed to assess the extent to which individuals experience PPU based on the addiction components model (Griffiths, 2001, 2005), including six core elements: (1) salience, when a behavior becomes the most important aspect of a person's life; (2) mood modification, understood as a change in subjective emotional experience as a consequence of engaging in the particular behavior; (3) conflict, interpersonal or intrapsychic arising from the behavior; (4) tolerance, understood as a process in which progressively greater involvement in the behavior is needed to experience the same effects as before or the same amount of engagement elicits less of a response; (5) relapse, defined as the tendency to repeatedly return to previous patterns of engaging in the behavior; and (6) withdrawal, understood as negative emotional states and/or physical symptoms that arise when the activity is stopped or significantly reduced. The PPCS has been used to identify PPU in research and clinical practice (Fernandez & Griffiths, 2021). In addition, a short version of the PPCS, the PPCS-6, has recently been validated and can be used as a brief assessment tool to help identify potential PPU (Bőthe et al., 2021a, 2021b, 2021c).

PPU has similarities with formal behavioral addictions, including gambling disorder (GD) (Mestre-Bach et al., 2020). The addictive potential of PPU has been proposed, including with regard to its sociodemographic and neural correlates (Mestre-Bach et al., 2020; Stark et al., 2018), and relationships with other impulsive or compulsive behaviors have also been described (Derbyshire & Grant, 2015). Consistent with these considerations, features like impulsivity, cravings, reward-seeking behavior, withdrawal, and tolerance symptoms have been reported in both PPU and GD (Lewczuk et al., 2021). Emotional dysregulation, a multidimensional construct that involves difficulties in making sense of and responding adaptively to emotional experiences (McRae & Gross, 2020), has been associated with multiple potentially addictive behaviors including problem gambling and PPU (see for a review: (Rogier & Velotti, 2018; Testa et al., 2024).

Similarities between GD and PPU include elevated prevalence estimates of both disorders in men (Bőthe et al., 2024; Tran et al., 2024). Interestingly, previous studies have reported frequent co-occurrence between GD and CSBD (Cowie et al., 2019; Grant & Kim, 2003; Grant & Steinberg, 2005).

Nonetheless, the precise nature of the association between PPU and GD remains poorly understood, and the addictive potential of sexually explicit materials has been debated (Love et al., 2015; Potenza et al., 2017). Hence, there is a need to validate measurement methods (Starcevic & Aboujaoude, 2017). Although the PPCS and PPCS-6 have been widely used in research studies, their validation in different cultural contexts requires further examination to ensure their applicability and generalizability. Validating the PPCS-6 in a GD treatment-seeking sample is justified, as it may help consider co-occurring problematic behaviors that are clinically relevant but often overlooked. Thus, the present study aimed to examine the psychometric properties of these instruments in a clinical sample of Spanish individuals with GD. Given the similarities mentioned above and the possible co-occurrence of the two disorders, it is important to assess whether the PPCS-6 is a valid instrument for evaluating PPU in clinical samples of individuals with GD.

The second aim was to test associations between the PPCS-6 and other Spanish-language measures of pornography use and motivations, expecting to find significant correlations that would support the convergent validity of the instrument. A third aim was to investigate associations between the PPCS-6 and several psychological dimensions, including emotion regulation, personality features, and psychopathological symptoms. We hypothesized that there would be significant correlations between the PPCS-6 and general difficulties in emotion regulation, particularly in dimensions related to limited effective strategies for regulating emotions. Such difficulties could be especially pronounced in individuals with co-occurring GD and PPU. Regarding personality features, we expected to find significant correlations between the PPCS-6 and features usually related to addictive tendencies such as impulsivity, novelty seeking and limited self-directness. Finally, it was expected that symptoms of general psychopathology would be positively correlated with higher PPCS-6 scores, potentially reflecting more severe clinical conditions.

Method

Participants

The research sample included 359 adults who were seeking treatment for GD at the Behavioral Addictions Unit at the University Hospital of Bellvitge. This hospital is widely recognized as a specialized tertiary care center for addressing behavioral addictions, especially complex cases. The hospital's services cater to a population exceeding two million

individuals residing in the southern region of the metropolitan area.

To be eligible for inclusion, participants needed to meet the following criteria: (1) age above 18 years; (2) any sex; and (3) GD as their primary health concern, as indicated by meeting the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-5) diagnostic criteria for GD (APA, 2013). Exclusion criteria included: (1) a history of brain injury or neurological disease and (2) the presence of an organic medical illness or neurodegenerative condition, as self-reported by the participants.

The distribution of the sociodemographic features and the gambling activity are shown in Table 1. Most participants were men ($n = 331$, 92.2%), single ($n = 205$, 57.1%), of low education levels ($n = 184$, 51.3%), employed ($n = 225$, 62.7%) and of a low social position ($n = 178$, 49.6%). Mean age was $M = 39.5$ years old ($SD = 13.6$), mean onset of the GD-related problems was $M = 28.3$ years old ($SD = 11.8$), and mean duration of the problematic gambling was 5.8 years ($SD = 6.5$). The distribution of the gambling preference was 39.3% only non-strategic, 42.6% only strategic, and 18.1% both non-strategic and strategic. The gambling modality was 50.4% offline, 27.9% online, and 21.7% mixed.

Table 1 Sample characteristics

	n	%
Sex		
Female	28	7.80%
Male	331	92.20%
Civil status		
Single	205	57.10%
Married or Couple	119	33.15%
Divorced or Separated	35	9.75%
Education		
Primary	184	51.25%
Secondary	143	39.83%
University	32	8.92%
Employment		
Unemployed	134	37.33%
Employed	225	62.67%
Social		
High	10	2.80%
Mean-high	36	10.02%
Mean	40	11.14%
Mean-low	95	26.46%
Low	178	49.58%
	Mean	*SD*
Age (years)	39.48	13.61
Addiction		
Onset (years)	28.30	11.78
Duration (years)	5.83	6.51
Gambling activity	*n*	%
Preference		
Non-strategic	141	39.28%
Strategic	153	42.62%
Mixed	65	18.10%
Modality		
Land based	181	50.42%
Online	100	27.85%
Mixed	78	21.73%

Measures

Problematic Pornography Consumption Scale—Short Version (PPCS-6 Bőthe et al., 2021a, 2021b, 2021c)

The PPCS-6 assesses PPU with six Likert-type items, with seven options of response (from 1 = Never, to 7 = All the time). Each item of the PPCS-6 represents a component from the component model of addiction (Griffiths, 2001, 2005). The PPCS-6 exhibited strong psychometric properties, including a well-established factor structure, measurement invariance, and high reliability in the original validation study (Bőthe et al., 2021a, 2021b, 2021c). In the study sample, the internal consistency of the scale was $\alpha = 0.88$.

Pornography Consumption Inventory (PCI; Reid et al., 2011)

The PCI evaluates motivations for pornography use through 13 items, each rated on a 5-point Likert-scale ranging from 1 = Never to 5 = Many times. Scores on the PCI range from 15 to 75, without a predefined cut-off point, where higher scores indicate greater inclinations to use pornography for specific purposes. In this study, we used the Spanish version of the PCI which has demonstrated an internal consistency of 0.930 using three factors (e.g., emotional avoidance, sexual curiosity, and excitement seeking and sexual pleasure) (Leon-Larios et al., 2019). The internal consistency estimated in the study sample was $\alpha = 0.92$ for emotional avoidance, $\alpha = 0.92$ for sexual curiosity, and $\alpha = 0.942$ for excitement seeking and sexual pleasure.

Symptom Checklist-Revised (SCL-90-R; Derogatis, 1994)

The SCL-90-R includes 90 items designed to gauge psychological distress and psychopathology, with each item rated along a 4-point Likert scale ranging from 0 = Not at all to 4 = Extremely. The SCL-90-R provides a comprehensive assessment by measuring nine distinct symptom dimensions, namely somatization, obsessive–compulsive tendencies, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation, and psychoticism. Additionally, the Global Severity Index (GSI), a widely acknowledged measure of overall psychopathological distress, offers

a global score. The Positive Symptom Distress Index (PSDI) gauges the distress intensity linked to reported symptoms, while the Positive Symptom Total (PST) quantifies the overall count of present symptoms on the SCL-90-R questionnaire. In this study, data collection employed the Spanish version of the questionnaire (Derogatis, 2002). The internal consistency estimated in the study sample for the global index was α = 0.98 (α = 0.91 for somatization, α = 0.88 for obsession-compulsion, α = 0.88 for interpersonal sensitivity, α = 0.92 for depression, α = 0.90 for anxiety, α = 0.84 for hostility, α = 0.85 for phobic anxiety, α = 0.80 for paranoid ideation, and α = 0.86 for psychoticism).

Impulsive Behavior Scale (UPPS-P Whiteside et al., 2001).

The UPPS-P is a self-administered instrument designed to assess five dimensions of impulsive behavior using 59 items each rated on a 4-point scale ranging from 1 = Strongly agree to 4 = Strongly disagree. These dimensions include negative urgency, positive urgency, lack of premeditation, lack of perseverance, and sensation-seeking. Participants are instructed to report on their behavior and attitudes over the preceding six-month period when assigning ratings. The Spanish version of the UPPS-P used in this research demonstrates good reliability, with Cronbach's α coefficients ranging from 0.79 to 0.93, and robust external validity, as established by Verdejo-García et al. (2010). In our sample, internal consistency was α = 0.91 for the total score, α = 0.81 for negative urgency, α = 0.92 for positive urgency, α = 0.83 for lack of premeditation, α = 0.75 for lack of perseverance, and α = 0.83 for sensation-seeking.

Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004).

The DERS is a self-report questionnaire that includes six subscales and 36 items (ranging from 1 = Never to 5 = Always) to assess emotional dysregulation. The DERS total score is an index of global difficulties in emotion regulation. Additionally, DERS subscales index six dimensions of emotional dysregulation: (1) lack of emotional awareness, which assesses difficulties in attending to emotional states; (2) lack of emotional clarity, which measures impairments in recognizing emotional experiences; (3) non-acceptance of emotional responses, reflecting a tendency to experience negative secondary emotional reactions; (4) difficulties engaging in goal-directed behavior, indicating challenges in accomplishing tasks in the presence of intense emotional states; (5) limited access to emotion regulation strategies, reflecting the belief that there are limited options for effectively regulating emotions during times of distress; and (6) impulse control difficulties, indicating difficulties in maintaining behavioral control when experiencing negative emotional states. The Spanish version of the questionnaire (Hervás & Jódar, 2008; Wolz et al., 2015) was employed for data collection. In our sample, internal consistency was α = 0.88, for the total scale, α = 0.88 for non-acceptance of emotional response, α = 0.79 for difficulties in goal-directed behaviors, α = 0.85 for impulse control difficulties, α = 0.75 for lack of emotional awareness, α = 0.77 for limited access to emotions, α = 0.99 for lack of emotional clarity.

Temperament and Character Inventory-Revised (TCI-R; Cloninger, 1999)

The TCI-R is a well-established and validated questionnaire that encompasses 240 items assessing various personality features. Participants are instructed to rate items on a five-point Likert-type scale. The questionnaire is structured into seven primary dimensions, including four temperamental factors (novelty-seeking, harm-avoidance, reward-dependence, and persistence) and three character dimensions (self-directedness, cooperativeness, and self-transcendence). For this study, we used the Spanish revised version of the TCI-R, which demonstrated satisfactory internal consistency, as evidenced by a mean Cronbach's alpha coefficient of 0.87 (Gutiérrez-Zotes et al., 2004). In the present study, internal consistency was α = 0.70 for reward-dependence, α = 0.73 for novelty-seeking, α = 0.77 for harm-avoidance, α = 0.75 for cooperativeness, α = 0.85 for self-transcendence, α = 0.83 for self-directedness, and α = 0.86 for persistence.

Other Sociodemographic and Clinical Variables

To gather additional demographic, clinical, and social/family information, a semi-structured face-to-face clinical interview (Jiménez-Murcia et al., 2006) was employed. This interview allowed for a comprehensive exploration of various variables related to gambling behavior, including age of onset of gambling and gambling-related problems, preferences in gambling activities (e.g., non-strategic gambling, such as slot machines or bingo; strategic gambling, such as poker or sports betting; and mixed preferences), and different modalities of gambling (e.g., land-based, online, and mixed).

Procedure

The PPCS-6 was translated from English into Spanish in accordance with the International Test Commission Guidelines for Translating and Adapting Tests (International Test Commission, 2010 [ITC]). Experienced bilingual clinical psychologists with extensive experience in behavioral addictions translated the items from the original English version into Spanish. The translated items were then back-translated by an independent native English speaker and the

observed differences between both versions were discussed and resolved by common consensus. The Spanish version of the PPCS-6 was then reviewed by two other independent Spanish-speaking clinical psychologists, who had not been involved in the previous back-translation process.

The sample was recruited between January 2021 and December 2022. Clinicians with more than 20 years of expertise in evaluating and treating GD were responsible for establishing diagnoses. Participants completed all the questionnaires in a single session at the hospital, with the entire procedure lasting approximately 90 min.

Statistical Analysis

Statistical analysis was conducted with Stata18 for Windows. A Confirmatory Factor Analysis (CFA) was used to examine the factor structure of the PPCS-6. In this work, and since with large sample sizes even minor departures from normality may be flagged as statistically significant due to high test power, multivariate normality tests were not reliable. Therefore, we obtained three separate estimations for the CFA: 1) Structural Equation Model (Stata's *sem* command) with maximum likelihood estimation method (*sem*-MLE); 2) *sem* with robust estimation method (*sem*-robust); and 3) Generalized Structural Equation Model (Stata's *gsem* command), which may be used for continuous, binary, ordinal, count or multinomial variables. Adequate goodness-of-fit was considered based on the usual standardized indices (Barrett, 2007): root mean square error of approximation ($RMSEA$) < 0.08, Bentler's Comparative Fit Index (CFI) > 0.90, Tucker-Lewis Index (TLI) > 0.90, and standardized root mean square residual ($SRMR$) < 0.10.

Next, the convergent-discriminative validity of the questionnaire versus external measures assessing the clinical state and the personality profile was estimated with partial correlation coefficients (adjusted for sex and age), and effect sizes were considered moderate for $|r| > 0.24$, good for $|r| > 0.30$ and large for $|r| > 0.37$ (Kelley & Preacher, 2012).

Results

Factor Structure of the PPCS-6

Table 2 shows the results for the *sem*-MLE estimation method testing the one-dimension structure for the PPCS-6 (similar results were obtained with the *sem*-robust and the *gsem* procedures, with all the items achieving significant coefficients). The one-factor solution was supported, with adequate goodness-of-fit ($\chi^2 = 4.39$, $p = 0.624$; $RMSEA = 0.001$; $CFI = 0.998$; $TLI = 0.999$; $SRMR = 0.013$), good internal consistency (Cronbach's $\alpha = 0.84$ and $\Omega = 0.88$), and significant standardized coefficients for each item (values between 0.529 to 0.798). High correlations between the items scores were obtained, with coefficients between 0.352 (for the association between items 1 and 5) and 0.689 (for the association between items 1 and 2).

Convergent-Discriminative Validity of the PPCS-6

Table 3 shows the partial correlations (adjusted for sex and age) between the PPCS-6 total score and the external study measures (SCL-90R, UPPS-P, DERS, TCI-R and PCI). Higher PPCS-6 scores were associated with more psychopathology (specifically, with higher scores on the SCL-90-R scales, except for somatization, anxiety, phobic anxiety, paranoia and PSDI), higher impulsivity (specifically, higher total scores on the UPPS-P), more difficulties in emotion regulation (particularly, with higher scores on the DERS total score and limited access to emotions subscale), and higher motivations for the consumption of pornography (as measured with the PCI scales). Additionally, PPCS-6 scores were inversely related to self-directedness, as measured with the TCI-R.

Discussion

Validated instruments are needed to accurately identify PPU and co-occurrence with GD. The current study assessed the psychometric proprieties of the Spanish version of the PPCS-6 in treatment-seeking individuals with GD, supporting the PPCS-6 as a short and valid instrument to assess PPU in the context of GD.

The CFA yielded compelling results, corroborating the model's good fit and providing evidence for the unidimensional nature of the PPCS-6, in alignment with previous investigations conducted in diverse populations (Alidost et al., 2022; Bőthe et al., 2021a, 2021b, 2021c, 2024; Volarov et al., 2025). The PPCS-6 demonstrated high reliability, suggesting that the items are consistent in measuring the same underlying construct of PPU.

In line with our hypotheses, the convergent validity of the scale was demonstrated through correlations with theoretically relevant constructs, such as motivations for pornography use. Notably, emotional avoidance emerged as the motivation showing the strongest association with PPCS-6 scores, indicating a strong link between using pornography as a coping mechanism for emotions or as an emotion-regulation strategy and the risk of PPU in patients with GD. Similarly, previous research in community samples demonstrated stronger links between PPU and emotional avoidance and stress reduction than other motivations such as pleasure-seeking or sexual curiosity (Bőthe et al., 2021a, 2021b, 2021c). Recognizing the role of emotional avoidance in PPU may help clinicians to identify GD patients at risk for co-occurring PPU and possibly facilitate early intervention to prevent transitions from

Table 2 Results of the confirmatory factor analysis, descriptive statistics, and reliability statistics

	Results obtained in the CFA						Descriptives			
Item	*Std.B*	*SE*	*z-stat*	*p*	*95%CI (Std.B)*		*Min*	*Max*	*Mean*	*SD*
I1. Porn is important	.718	.033	21.99	< .001	.654	.782	1	7	2.075	1.50
I2. Porn relaxes tension	.740	.032	23.09	< .001	.677	.803	1	7	2.894	1.64
I3. Neglecting hobbies	.763	.029	26.69	< .001	.707	.819	1	7	1.557	1.15
I4. Porn is needed	.798	.027	29.92	< .001	.746	.851	1	6	1.669	1.17
I5. Cannot stop watching	.529	.044	12.14	< .001	.443	.614	1	7	1.744	1.51
I6. Stressed without porn	.639	.038	16.99	< .001	.565	.713	1	7	1.284	.86
Consistency	Cronbach's alpha: = α0.846; Omega: = Ω0.883									
Fit statistics	χ^{a} = 4.39 (*p* = .624); *RMSEA* = 0.001 (95%CI: 0.001 to 0.057); *CFI* = 0.998; *TLI* = 0.999; *SRMR* = 0.013									
Correlation and reliability	*R-coef*	I2	I3	I4	I5	I6	*SM-ID*	*SV-ID*	*CI-TC*	*CA-ID*
	I1	.689	.560	.574	.352	.444	9.148	23.942	.689	.808
	I2	—	.567	.595	.369	.383	8.329	22.847	.687	.811
	I3		—	.596	.391	.500	9.666	26.961	.675	.814
	I4			—	.458	.510	9.554	26.382	.714	.807
	I5				—	.553	9.479	26.245	.509	.847
	I6					—	9.939	29.952	.606	.833
Summary item statistics			*Mean*		*Min*		*Max*		*Variance*	
	Item means		1.87		1.28		2.89		.31	
	Item variances		1.79		.74		2.72		.56	
	Inter-item corr		.50		.35		.68		.01	

Std.B: standardized coefficient. *SE*: standard error. *95%CI*: 95% confidence interval. I1 to I6: item 1 to item 6

RMSEA: Root Mean Square Residual. *CFI*: Comparative Fit Index. *TLI*: Tucker-Lewis Index. *SRMR*: Standardized Root Mean Square Residual

SM-ID: scale mean if item deleted. *SV-ID*: scale variance if item deleted

CI-TC: corrected item—total correlation. *CA-ID*: Cronbach's alpha if item deleted

Inter-item corr.: inter-item correlations Sample size: *n* = 359

one potentially addictive behavior (e.g., gambling) to another (e.g., pornography use).

The correlations between PPCS-6 scores and the total DERS score and the one subscale score were partially consistent with expectations and suggest that GD individuals with difficulties in emotion regulation, especially those with limited access to their emotions, may have greater vulnerability to developing PPU. Previous studies support this finding, showing emotion dysregulation among individuals with GD (Marchica et al., 2019; Neophytou et al., 2023; Velotti et al., 2021), as well as in those with frequent pornography use and PPU (Cardoso et al., 2022). Our results add to the existing literature by suggesting that individuals with GD and greater emotion regulation difficulties may be at elevated risk of developing both GD and PPU. Interestingly, of the six dimensions of the DERS, only "limited access to emotion regulation strategies" was significantly positively correlated with PPCS-6 scores, reflecting difficulties individuals experience in accessing adaptive strategies for emotion regulation. While other dimensions of emotion regulation, such as emotional clarity and impulse control, have been identified in separate samples of individuals with GD or PPU (Velotti, 2021; Cardoso, 2023), limited access to emotion regulation strategies may play a critical role in the context of co-occurring disorders. This underscores the importance of interventions aimed at improving emotion regulation, particularly through increasing access to emotions to promote the development of adaptive coping mechanisms, for individuals dealing with both GD and PPU.

Regarding personality features associated with PPU, the results of this study showed that higher levels of self-reported impulsivity and lower self-directedness were related to higher PPU. Previous research has associated impulsivity and impulsive tendencies with frequent pornography use and PPU (Bocci Benucci et al., 2024; Bőthe et al., 2019; Testa, Mestre-Bach, et al., 2024; Volarov et al., 2025). Similarly, low self-directedness, reflecting tendencies not to align actions with long-term goals, is often observed in individuals with problematic substance use and addictive behaviors (Hahn et al., 2017; Montag et al., 2010; Steingrimsson et al., 2020). In the context of GD, low self-directedness has statistically predicted more severe symptoms, earlier onset, and longer duration of the disorder (Forbush et al., 2008; Janiri et al., 2007; Jiménez-Murcia et al., 2021; Moragas

Table 3 Correlation matrix assessing the relationships between the PPCS-6 scores and external measures: convergent/discriminant validity (n = 359)

SCL-90-R Somatization	.197	DERS Non acceptance emotions	.148
SCL-90-R Obsessive/compulsive	**.255**	DERS Diff. directed behaviors	.186
SCL-90-R Interpersonal sensitivity	**.266**	DERS Impulse control difficulties	.200
SCL-90-R Depressive	**.240**	DERS Lack emotional awareness	.085
SCL-90-R Anxiety	.186	DERS Limited access emotions	**.239**
SCL-90-R Hostility	**.241**	DERS Lack emotional clarity	.201
SCL-90-R Phobic anxiety	.153	DERS Total	**.246**
SCL-90-R Paranoid Ideation	.224	TCI-R Novelty seeking	.074
SCL-90-R Psychotic	**.271**	TCI-R Harm avoidance	.110
SCL-90-R GSI	**.257**	TCI-R Reward dependence	− .048
SCL-90-R PST	**.278**	TCI-R Persistence	− .007
SCL-90-R PSDI	.208	TCI-R Self-directedness	**− .316**
UPPS-P Lack premeditation	.114	TCI-R Cooperativeness	− .176
UPPS-P Lack perseveration	.209	TCI-R Self-transcendence	.176
UPPS-P Sensation seeking	.216	[1]PCI Emotional avoidance	**.622**
UPPS-P Positive urgency	.196	[1]PCI Sexual curiosity	**.478**
UPPS-P Negative urgency	.179	[1]PCI Excitement pleasure	**.574**
UPPS-P Total	**.283**		

Partial correlations adjusted by sex and age. Bold: effect size into the mild-moderate to large-high range

SCL-90-R Symptom Checklist-Revised; *GSI* Global Severity Index; *PST* Positive Symptom Total; *PSDI* Positive Symptom Distress Index; *DERS* Difficulties in Emotion Regulation Scale; *TCI-R* Temperament and Character Inventory-Revised; *UPPS-P* Impulsive Behavior Scale. *PCI* Pornography Consumption Inventory. [1]Sample size: $n = 196$

et al., 2015; Pettorruso et al., 2021; Valero-Solís et al., 2018). Other personality features were not significantly associated with PPCS-6 scores in this study. This may be explained by previous evidence suggesting that GD patients seeking treatment can exhibit different clinical phenotypes, characterized by distinct personality features, varying levels of GD severity, and co-occurring disorders (Granero et al., 2021; Jiménez-Murcia et al., 2019). These findings suggest that a specific personality profile in GD patients, characterized by impulsivity and impaired decision-making and goal-directed tendencies, may increase their vulnerability to engaging in PPU.

Despite the ongoing debate regarding the classification of CSBD and PPU (Bőthe et al., 2022; Castro-Calvo et al., 2022; Rumpf & Montag, 2022; Sassover & Weinstein, 2020), the findings of this study can be interpreted within the framework of the six-component model of addiction (Griffiths, 2005). The PPCS-6 reflects the components of salience, mood modification, tolerance, withdrawal symptoms, conflict, and relapse, providing a comprehensive measure of PPU as an addiction-like behavior. These components align with impulsivity and emotion dysregulation observed in our findings, suggesting that individuals with these features may struggle to regulate their pornography use. Moreover, impulsivity and emotion dysregulation are common mechanisms across various behavioral addictions (Brand et al., 2019), making them key factors in understanding PPU within the broader addiction spectrum. However, given that impulsivity and emotional dysregulation are often seen in impulse control disorders, the findings align to some extent with considerations of PPU within both the categories of impulse control disorders and addictive behaviors.

The present findings also showed that PPU was positively associated with general psychopathological symptoms, including global distress, psychological tension, depressive symptoms, obsessive–compulsive tendencies, heightened sensitivity in interpersonal relationships, psychotic symptoms, and increased hostility, with weak-to-moderate effect sizes. Previous studies have reported elevated psychological distress and psychopathological symptoms in individuals with PPU (Bibi et al., 2022; Borgogna et al., 2018; Hernández et al., 2023; Hernández-Mora & Varescon, 2022; Shirk et al., 2021; Whitfield et al., 2018). The link with obsessive–compulsive tendencies suggests that PPU may relate to compulsive tendencies, consistent with a CSBD designation.

The co-occurrence of GD and PPU may reasonably be expected to be associated with heightened levels of psychological distress and addictive tendencies, compared to experiencing one disorder alone. Clinically, these findings raise the intriguing possibility that integrating treatment for both PPU and associated psychopathological symptoms may be beneficial, especially when these concerns co-occur with other addictive behaviors like GD that may share common mechanisms related to emotional regulation and impulsivity. By considering the broader mental health context, clinicians may provide more effective and tailored care to individuals experiencing these addictive behaviors. Potentially, the

findings may also be relevant to prevention interventions, as approaches to target impulsive tendencies and strengthen emotion regulation in developing youth have been linked to less engagement in addictive behaviors four to five years later (Conrod et al., 2025).

Strength and Limitations

While previous studies have successfully validated the PPCS-6 in community samples (Bőthe et al., 2021a, 2021b, 2021c, 2024), its validation within the context of GD treatment had been largely unexplored. Consequently, this study expands our understanding of PPU assessment in individuals with GD and provides valuable insights into PPU among individuals with GD. Despite its novelty and strengths, the study has limitations that should be considered when interpreting the results. First, although the short PPCS-6 demonstrates good psychometric properties, we have not conducted a validation of the full version of the scale, which provides a more comprehensive assessment of PPU through the definition of specific subscales. Nonetheless, the abbreviated version consisting of only six items is particularly convenient for use as a rapid screening tool for PPU in various clinical settings. Another limitation is that the sample was largely male, hindering the assessment of gender-related invariance, as had been investigated in the original validation study (Bőthe et al., 2018, 2019). Despite known gender-related differences in the prevalence of PPU and GD (with higher estimates in men), future studies including a larger group of women and gender-diverse individuals are encouraged. Additionally, the present study employed a cross-sectional, self-report survey methodology, which is susceptible to recall and other biases. Lastly, the approximately 90-min survey duration may have influenced the quality of responses. Therefore, results should be interpreted considering these limitations.

Conclusions

Assessment of PPU in individuals with GD is important for clinical practice and requires validated tools. The findings address a gap in understanding, underscore the robust psychometric properties of the Spanish version of the PPCS-6 among adults with GD, and highlight its utility as a reliable and concise screening tool for PPU in clinical settings. The co-occurrence of GD and PPU could contribute to a more severe clinical profile marked by elevated levels of general psychopathology, including heightened psychological distress, challenges in emotion recognition and regulation, increased impulsivity, and diminished self-directedness. These dimensions are common among individuals with addictions and link to the components model of addictions for PPU, although the findings also resonate with other clinical categorizations.

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Data Availability Data and images are available on request from the authors.

Declarations

Conflict of interest The authors report no conflicts of interest with respect to the content of this manuscript. Dr. Fernández-Aranda and Dr. Jiménez-Murcia received consultancy honoraria from Novo Nordisk. Dr. Potenza discloses that he has consulted for and advised Baria-Tek and Boehringer Ingelheim; been involved in a patent application with Yale University and Novartis; received research support from the Mohegan Sun Casino and the Connecticut Council on Problem Gambling; consulted for or advised legal, non-profit, healthcare and gambling entities on issues related to impulse control, internet use and addictive behaviors; performed grant reviews; edited journals/journal sections; given academic lectures in grand rounds, CME events, and other clinical/scientific venues; and generated books or chapters for publishers of mental health texts. The University of Gibraltar receives funding from the Gibraltar Gambling Care Foundation, an independent, not-for-profit charity. ELTE Eötvös Loránd University receives funding from Szerencsejáték Ltd. (the gambling operator of the Hungarian government) to maintain a telephone helpline service for problematic gambling. However, these funding sources aren't related to this study, and the funding institution had no role in the study design or the collection, analysis, and interpretation of the data, writing the manuscript, or the decision to submit the paper for publication. The rest of the authors have no disclosures.

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Informed Consent All subjects were informed about the study and all provided THE written informed consent.

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