

PARAPHILIAS

Predictors of Pornography Use: Difficulties in Emotion Regulation and Loneliness



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ABSTRACT

Background: Pleasure-seeking reasons are the main drivers of pornography use (PU), but the regulation of unpleasant states, namely distraction from or suppression of negative emotions and stress relief, are other potential predictors of this behavior.

Aim: Our main objective is to develop an explanatory model of problematic PU, assessing difficulties in emotion regulation, loneliness, perceived stress, as well as age and gender as predictors.

Methods: A cross-sectional study was conducted that included a total of 340 participants ($M = 28.50$ years, $SD = 10.32$). Self-report inventories were administered that measured problematic PU (PPCS), difficulties in emotion regulation (DERS-SF), loneliness (UCLALS-3), and perceived stress (PSS-10).

Results: The findings were indicative of recreational PU, with only a small number of participants (4.6%) reporting a possible problematic PU. There were statistically significant gender differences ($F(1,337) = 33.306, P \leq .001$), namely that men were more likely to report problematic PU ($M = 36.03, SD = 21.30$) than women ($M = 25.32, SD = 9.24$). Problematic PU was significantly and positively correlated either with difficulties in emotion regulation, loneliness, perceived stress and age. Stepwise multiple linear regression analysis showed that difficulties in emotion regulation ($\beta = 0.259, P \leq .001$), loneliness ($\beta = 0.209, P = .001$), and gender ($\beta = -0.377, P \leq .001$) define the best subset of predictors of problematic PU. Age and perceived stress were not selected as predictors in this subset.

Clinical Translation: The promotion of better emotion regulation abilities and strategies for adaptive coping with loneliness must be taken into consideration, namely in cases of problematic PU or compulsive sexual behavior disorder.

Strengths & Limitations: Being a cross-sectional study with a convenience sample and the fact that these variables explain only a part of the explained variance of the problematic PU are the main limitations. Despite the limitations, the principal contribution of this study is the understanding that gender, difficulties in emotion regulation, and loneliness remain as main predictors of problematic PU, even when combined in the explanatory model.

Conclusion: The current study provides a better understanding of the predictors of problematic PU related with the reduction or avoidance of unpleasant states. Emotion regulation, loneliness, and perceived stress, studied simultaneously, provide a better understanding of the complex relationships between these factors and problematic PU. Difficulties in emotion regulation and loneliness are predictors of higher problematic PU, as well as the expected gender effect. **Cardoso J, Ramos C, Brito J, et al. Predictors of Pornography Use: Difficulties in Emotion Regulation and Loneliness. J Sex Med 2022;19:620–628.**

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Key Words: Pornography; Predictors of Pornography Use; Difficulties in Emotion Regulation; Loneliness; Perceived Stress

Received September 3, 2021. Accepted January 7, 2022.

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<https://doi.org/10.1016/j.jsxm.2022.01.005>

INTRODUCTION

The use of pornography has become increasingly common worldwide.¹ This can be largely explained by widespread access to the Internet.² To illustrate this, recently, the world's biggest pornography site reported an average of over 100 million daily visits (84% from mobile devices) and over 36 billion visits per

year, from all parts of the world and representing a large variety of cultural and socio-economic backgrounds.³

Despite a lack of consensus about what pornography is and how to conceptualize pornography use (PU), there are two general approaches: one focuses on the nature and content of materials, and the other emphasizes the function of pornography.⁴ According to this perspective, pornography can be defined as any kind of material containing explicit representations of sexual acts, usually, but not always, intended to sexually arouse the viewer(s).^{5,6}

Literature has shown that men, particularly younger men,⁷ use pornography more often,^{8,9} spend more time consuming pornography,¹⁰ are more sexually aroused by this stimulus, use pornography more frequently during masturbation,¹¹ and report more positive attitudes towards pornography.¹² However, the fact that research related to PU tends to be male-centered, and the possibility that women under-report their PU due to socio-cultural reasons and gender role effects, advises caution in generalizing findings.¹³ Regarding age, there is a predominance of samples composed of college students, which suggests a lack of age diversity in PU research.¹⁴ The studies that have used samples with higher heterogeneity regarding this demographic variable have reported greater PU among younger adults and a decrease in PU across age,^{14,15,16} which may be associated with general changes in sexual interest and activity.

Research on pornography often places the spotlight on its negative effects, namely as regards its impact on the well-being and mental health of consumers. However, it has been demonstrated that PU may be the consequence of psychological problems, in addition to, or instead of, a determinant.⁸ Consistent with this view, it was longitudinally verified that low life satisfaction anticipates increases in PU.⁶ The viewing of pornography is often associated with the quantity and frequency of the behavior, but also with other factors (eg, emotional distress, solitary use or dyadic use, sexual well-being) determining distinct PU profiles: recreational, highly distressed non-compulsive, and compulsive.¹⁰ Another study also proposed 3 profiles (non-problematic, low-risk, and at-risk) with evidence of different levels of PU frequency, time devoted to PU, and perception of loneliness.¹⁷

A recent systematic review indicates that hedonic motives are the main drivers of PU, specifically masturbation enhancement and sexual arousal, but there are other potential motivations for this behavior: curiosity and information-seeking; intimacy and relationship goals, particularly in pornography shared by the couple; and coping with unpleasant states.¹³ This last motivation underlying PU generically aims to promote distraction from or suppression of negative emotions, as well as stress relief.^{18,19}

A deeper look at these reasons reveals the need to better understand the link between emotion regulation and PU, including problematic PU. Emotion regulation refers to the processes by which individuals modify their emotional reactions in coping with stressors and negative affective states.²⁰ Considering a

multidimensional conceptualization, emotion regulation includes the understanding and acceptance of emotional experiences; the ability to control impulsive behaviors while experiencing negative emotions; and the ability to use flexible and appropriate emotion regulation strategies, aimed at achieving individual goals and at dealing with the demands of the situation.²¹ The relative absence of any or all of these capacities may indicate the presence of difficulties in emotion regulation. Research found that emotion regulation skills predict objective health indicators and are associated with greater happiness and more satisfying social and marital relationships.²² In the opposite direction, deficits in emotion regulation underlie several maladaptive health outcomes.^{23,24}

Previous studies have provided empirical evidence that individuals with more difficulties in emotion regulation show higher impulsivity,²⁵ have higher problematic internet use,²⁶ and are more likely to engage in addictive behaviors,²⁷ including compulsive sexual behavior.²⁴ The process of emotion regulation can influence the decision to resort to pornography and the rewarding effects of using it may reduce negative emotions and perceived stress, reinforcing the cognitions associated with using pornography and increasing the likelihood of consolidating PU as a coping strategy.²⁸ After previous research supported a link between rigid avoidant behaviors and problematic pornography viewing,²⁹ it was shown that emotional avoidance, specifically, was the strongest and most consistent predictor of frequent PU, over-riding motivations of sexual pleasure and excitement seeking.³⁰ According to the authors, these results support the view that the negative effects (or, in other words, the problematic use) of pornography may be more related to the function for which pornography is used, namely as a strategy to avoid aversive internal states, than to the frequency of its viewing. Likewise, it was shown that in men with problematic PU, accompanied by multiple masturbations, several kinds of emotional triggers induce compulsivity: loneliness, stress, problems in personal life, fear of disappointing the expectations of significant others, anger, and rejection.³¹ Most of the participants experienced positive emotions (eg, excitement, pleasure), emotional dissociation, and thoughts related to a cut-off from thinking while consuming pornography. Once they'd used pornography the negative emotions came back, now including shame, guilt, sadness, and anxiety, which is no wonder given the widespread prevalence of negative attitudes toward pornography.³² In other words, negative emotions can determine PU and, at the same time, be a consequence of that very use.

Loneliness has been associated to difficulties in emotion regulation,³³ emotional skill deficits³⁴ and pornography consumption,^{35,36} and a possible bidirectional relation between PU and loneliness has also been suggested.³⁷ Loneliness is a subjective, unpleasant, and distressing experience related to a deficit in social relationships.³⁸ Although perceived loneliness is different from the objective state of solitude or being alone,³⁹ the lack of an intimate relationship in everyday life may promote or reinforce PU.⁴⁰ Putting forward the compensatory effect of

pornography, another study indicated loneliness as a predictor of PU, particularly among individuals with higher attachment anxiety and fear of rejection.⁴¹ It was also found that loneliness had a negative mediating effect on the association between PU and satisfaction with life.⁴²

Additionally, stress levels are known to impact on emotion regulation processes, often leading to a restricted range of emotional responses.⁴³ When being confronted with adverse circumstances, those who are more vulnerable to stress tend to be more impulsive and to use more dysfunctional strategies.²⁸ At the same time, lonely individuals are more likely to cope with stressors through passive strategies rather than through active coping.³⁹ Perceived stress in daily life correlated positively with PU,⁴⁴ and it was found that stress reduction motivations were related to increased frequency of PU, with a possible contribution to the development of a problematic use.¹⁹

In sum, there is a consensus in the literature about the existence of an emotional motivation for the use of pornography, with the intention of coping with adverse emotions and stressful life events. Thus, it is important to study the role of the difficulties in emotion regulation in PU, particularly in its problematic use. Loneliness and perceived stress, as possible unpleasant states that require emotion regulation, are associated with a higher PU. Other sociodemographic variables such as age and gender have also been correlated with PU. In this study, our main objective is to develop an explanatory model of problematic PU, assessing difficulties in emotion regulation, loneliness, perceived stress, as well as age and gender as predictors.

METHOD

Procedure

The study was conducted in accordance with the Declaration of Helsinki and was approved by the Institutional Ethical Review Board of the research team's university. This is an observational, descriptive and cross-sectional study. Participants were recruited through a convenient sampling process, using advertisements on social media (Facebook and Instagram) with a link to the online survey. Data were collected between January 2019 and April 2019. All participants were informed about the aim of the study and consent was obtained before data collection. Only individuals who were at least 18 years old were invited to participate.

Participants

The initial sample was composed by 640 participants (male, $n = 243$, 38.0%; female, $n = 397$, 62%). Among them, 300 participants (46.9%) who had not used pornography at least once in the past 6 months prior to the study were excluded.

The final sample comprised 340 participants with a mean age of 28.50 years old ($SD = 10.32$), mostly men ($n = 187$, 55.2%). Regarding participants' educational levels, most of the participants had completed secondary school ($n = 155$, 45.6%), or

higher education ($n = 175$, 51.5%). Concerning their professional status, 170 (50%) were employed and 150 (44.1%) were students. Most of participants were single ($n = 262$, 77.1%) and were in a relationship ($n = 212$, 62.4%). Regarding sexual orientation, 304 respondents reported to be heterosexual (89.4%) and 35 identified themselves as LGBTQ (10.3%). Finally, 187 (55%) participants stated they had no religion.

Concerning the regularity of PU in the past 6 months, 88 participants (25.9%) reported a frequency of 1–3 times a week, 81 (23.8%) 2–3 times a month, and 41 (12.1%) every day or almost every day. Most of the participants reported spending from 6 to 15 minutes ($n = 127$, 37.4%), or 16–30 minutes ($n = 104$, 30.6%), using pornography on each occasion. Additional socio-demographic data and features on frequency and duration of PU are displayed on [Table 1](#).

Measures

Prior to the standardized assessment scales, participants completed a brief questionnaire with socio-demographic data and PU habits (frequency of PU, and duration of PU per session).

Problematic Pornography Use. Problematic Pornography Consumption Scale (PPCS).¹⁹ The PPCS is an 18-item self-reported measure, developed to assess the consumption of pornography, allowing to distinguish between problematic and non-problematic use. Respondents rate items concerning past-6-month use of pornography, using a 7-point Likert scale, ranging from 1 (never) to 7 (all the time). A cut-off of 76 points was proposed to identify a possible problematic PU. The internal consistency of the PPCS original study was excellent ($\alpha = 0.93$) as in the present study ($\alpha = 0.95$).

Difficulties in Emotion Regulation. The Difficulties in Emotion Regulation Scale Short Form (DERS-SF).⁴⁵ The DERS-SF is an 18-item self-report measure, developed to assess difficulties in emotion regulation through 6 subscales: Strategies, Non-acceptance, Impulse, Goals, Awareness, and Clarity. Participants are asked to indicate how often the items apply to them, using a 5-point Likert scale, ranging from 1 (almost never) to 5 (almost always). Higher scores reflect greater difficulties in emotion regulation. This scale has excellent psychometric properties, with Cronbach's alpha ranging between 0.79 and 0.91 in the different subscales, and 0.94 for the total scale.⁴⁵ In the present study, the DERS-SF showed good reliability for the total scale ($\alpha = 0.90$), with the subscales' reliability ranging from 0.69 (Awareness) to 0.90 (Goals).

Loneliness. The University of California Los Angeles Loneliness Scale – Version 3 (UCLALS-3).⁴⁶ This scale is a self-reported measure, used to assess feelings of loneliness, social isolation and lack of connectedness. Its 20 items suggest experiences related to both emotional and social dimensions of loneliness; 9

Table 1. Socio-demographic characteristics and pornography use habits (n = 340)

Socio-demographic characteristic	n	%
Age (M, SD)	28.50	10.32
Gender		
Female	152	44.8
Male	187	55.2
Marital Status		
Single	262	77.1
Married	62	18.2
Divorced	16	4.7
Educational Level		
Primary school degree or less	2	0.6
High school degree	163	48
Higher education degree	175	51.5
Professional Status		
Student	150	44.1
Employed	170	50.0
Unemployed	19	5.6
Retired	1	0.3
In a Relationship	212	62.4
Sexual Orientation		
Heterosexual	304	89.4
Homosexual	16	4.7
Bisexual	19	5.6
Other	1	0.3
Religion		
None	187	55.0
Catholic	126	37.1
Other	27	7.0
<i>Pornography Use Habits</i>	<i>n</i>	<i>%</i>
Frequency of pornography use		
Rarely	77	22.6
Once a month or less	47	13.8
2 – 3 times a month	81	23.8
1 – 3 times a week	88	25.9
Every day or almost every day	41	12.1
Several times during the day	6	1.8
Duration of pornography use (min)		
1 – 5 min	60	17.6
6 – 15 min	127	37.4
16 – 30 min	104	30.6
31 – 45 min	35	10.3
46 – 60 min	8	2.4
> 60 min	6	1.8

M = Mean; SD = Standard Deviation.

are positively worded (absence of loneliness) and 11 are negatively worded (presence of loneliness). Participants rate items on a 4-point Likert scale ranging from 1 (never) to 4 (always). A higher total score indicates a greater perception of loneliness, with no identified cut-off score. Russel⁴⁶ reported a Cronbach's alpha ranging between 0.89 and 0.94 across the samples used in the original study of the psychometric properties of the scale. In

our study the UCLALS-3 also demonstrated similar levels of reliability ($\alpha = 0.94$).

Perceived Stress. The Perceived Stress Scale-10 (PSS-10).^{47,48} The PSS-10 is a 10-item self-report measure, used to assess the perceived stress related to intense, unpredictable, or uncontrollable events that occurred during the previous month. The items are rated on 5-point Likert scale, ranging from 0 (never) to 4 (very often), with higher scores indicating greater levels of perceived stress. The PSS-10 has good psychometric properties, with Cronbach's alpha ranging between 0.84 and 0.86 across three different samples in the original study,⁴⁷ and the same was demonstrated in our sample ($\alpha = 0.86$).

Data Analysis

Firstly, descriptive statistics of socio-demographic variables, PU habits, problematic PU, difficulties in emotion regulation, loneliness and perceived stress, were computed. In order to explore the presence/absence and the directions of associations between problematic PU and the other variables, bivariate correlations were calculated, using Cramer's V or Spearman correlation coefficient. The independent variables with a significant correlation with problematic PU were included in the subsequent Regression analysis. The analysis of differences of problematic PU between gender groups was performed through a one-way ANOVA. The assumptions were verified before conducting the test.

To analyse the effect of the predisposing factors of problematic PU (ie, difficulties in emotion regulation, loneliness, perceived stress, age, and gender), a Multiple Linear Regression was performed, with problematic PU as dependent variable. Multiple Linear Regression assumptions were verified. The stepwise regression procedure was applied to select the best subset of predictors of problematic PU. Durbin-Watson statistics were conducted to detect the presence of autocorrelations in the residuals, using scores approximately from 2.

Also, multicollinearity was assessed, using a value of variance inflation factor (VIF) of 5.⁴⁹ The statistical analysis was performed using SPSS (IBM SPSS Statistics. Version 27, Armonk, NY: IBM Corp). All statistical tests were two-tailed, and a P-value $\leq .05$ was considered significant.

RESULTS

Firstly, the descriptive statistics of problematic PU, difficulties in emotion regulation, loneliness and perceived stress (ie, mean, standard deviation, min, max, skewness, kurtosis and Cronbach's alpha) were calculated. All variables follow a normal distribution and reveal a high, good or excellent reliability, as displayed in Table 2.

Concerning socio-demographic variables, problematic PU was significantly and positively correlated with age ($V = 0.501$,

Table 2. Descriptive statistics (n = 340)

Variable	α	Min	Max	M	SD	Sk	Ku
Problematic pornography use	0.96	18	110	31.21	17.76	2.51	6.56
Saliency	0.77	3	19	5.91	3.10	1.53	2.28
Mood Modification	0.82	3	20	6.94	4.18	1.32	1.40
Conflict	0.78	3	18	4.22	2.63	2.84	8.25
Tolerance	0.85	3	21	5.01	3.50	2.36	5.47
Relapse	0.89	3	20	4.75	3.52	2.40	5.17
Withdrawal	0.90	3	20	4.40	3.16	3.07	9.18
Difficulties in emotion regulation	0.91	18	80	39.26	12.98	0.72	-0.19
Strategies	0.87	3	15	6.09	3.14	1.02	0.25
Non-acceptance	0.81	3	15	6.31	2.95	0.78	-0.24
Impulse	0.90	3	15	5.65	3.01	1.16	0.52
Goals	0.91	3	15	7.89	3.46	0.43	-0.81
Awareness	0.69	3	15	7.32	2.84	0.62	-0.06
Clarity	0.81	3	15	6.00	2.75	1.10	0.89
Loneliness	0.94	22	75	44.69	11.75	0.29	-0.60
Perceived stress	0.86	0	39	18.61	7.57	0.19	-0.42

Ku = Kurtosis; M = Mean; SD = Standard Deviation; Sk = Skewness.

$P \leq .001$), and frequency of consumption ($r_s = 0.613$, $P \leq .001$). A one-way ANOVA was used to evaluate the differences between gender regarding problematic PU. The statistical assumptions for the one-way ANOVA were met. Significant gender differences in the consumption of pornography were found ($F(1,337) = 33.306$, $P \leq .001$), with men ($M = 36.03$, $SD = 21.30$) using more pornography than women ($M = 25.32$, $SD = 9.24$).

The Spearman Correlations showed that problematic PU was significantly and positively correlated with difficulties in emotion regulation ($r_s = 0.326$, $P \leq .001$), loneliness ($r_s = 0.295$, $P \leq .001$), and perceived stress ($r_s = 0.198$, $P \leq .001$).

Explanatory Model of Problematic PU

A Multiple Linear Regression model including difficulties in emotion regulation, loneliness, perceived stress, age and gender as predictors, and problematic PU as dependent variable, were

fitted to the data. The response variable was log-transformed to meet the normality and homoscedasticity assumptions for residual distribution. The assumption of error independence was checked using the Durbin-Watson statistics, and multicollinearity was assessed using the variance inflation factors (VIF) of each predictor. The stepwise regression procedure was applied to select the best subset of predictors, using the probability of F to enter (0.05) and to remove (0.1) criterion. Following this method, the best subset of predictors of problematic PU included the effects of gender ($\beta = -0.377$, $P \leq .001$), difficulties in emotion regulation ($\beta = 0.259$, $P \leq .001$), and loneliness ($\beta = 0.209$, $P = .001$), with an adjusted R-square value of 0.286 and a residual mean square (RMS) of 0.180. As shown by the β values in Table 3, problematic PU was most influenced by gender, being significantly higher in men, and increases with increasing difficulties in emotion regulation and loneliness.

The degree of multicollinearity between selected predictors is far from excessive and did not jeopardize the power to detect the effects of those predictors independently of each other. Additionally, all subset regression was implemented involving all possible models with the 5 predictors (32 in total, data not shown), using the Mallows Cp statistic, the residual mean square and the value of R-square achieved by the least squares fit as criteria for selection of best model. The results showed that the minimum Cp statistic (3.491) was achieved precisely with the model in Table 3, whose adjusted R-square and RMS values were essentially the same of those of the full model, respectively 0.287 and 0.180.

DISCUSSION

Considering the relevance of PU motivations related to emotional adjustment and stress relief, the main purpose of the current study was to analyse the predisposing factors of problematic PU (ie, difficulties in emotion regulation, loneliness, perceived stress, age and gender), through an explanatory model.

The initial descriptive analysis demonstrated that slightly more than half of the initial sample used pornography in the past 6 months, once again supporting PU as common behavior.¹ Men reported a higher PU than women, in line with numerous studies in different cultural contexts⁸; 16 participants can have a problematic PU, according to the cut-off score to differentiate problematic from non-problematic PU,¹⁷ but it is clearly a sample broadly consistent with a recreational profile.¹⁰

Table 3. Multiple regression model of problematic PU (n = 340)

Predictor	Regression coefficient (B)	Std error of B	Standardized regression coefficient (β)	t	P	VIF
Constant	0.262	0.093		2.806	.005	
Gender	-0.380	0.047	-0.377	-8.158	< .001	1.011
Difficulties in emotion regulation	0.010	0.002	0.259	4.281	< .001	1.734
Loneliness	0.009	0.003	0.209	3.465	.001	1.722

In line with previous studies,^{30,41,44} we found significant positive associations between difficulties in emotion regulation, loneliness, perceived stress and pornography use, supporting the inclusion of these variables in the explanatory model of problematic PU.

According to the results of our regression model, difficulties in emotion regulation, loneliness and gender are the main predictors of problematic PU, with age and perceived stress losing their predictive value, after controlling for the effects of the other predictors in the selected model. As previously assumed in the systematic review conducted by Grubbs,¹³ also in our model, gender is the greatest predictor of PU, with men showing higher levels of problematic PU. There are several reasons for the consistent male predominance on PU, including socio-cultural norms related to sexuality and gender roles.¹³ In the present study, and although difficulties in emotion regulation and loneliness are both significant predictors of problematic PU, the gender effect prevails over the others. Men primarily reported PU for sexual arousal/masturbation, when comparing with women, who reported PU as part of a shared sexual activity with their partners.⁵⁰ It is most likely that this male motivation based on arousal-seeking is associated with gender roles and with the social representation of what it is to be a man and therefore the importance of PU to regulate unpleasant emotional states is dimmed by the gender effect. These gender differences may also be related to sexual drive. Although it has been shown that sexual drive was associated with higher PU for both men and women, it was only associated with greater compulsivity for men.⁵¹ Furthermore, it was found that men with high sexual desire reported more positive attitudes toward PU, compared to the rest of the sample surveyed.⁵²

Sexual behavior as an emotion regulation strategy has been documented for a long time.^{53,54} According to our results, participants with greater difficulties in emotion regulation showed a higher problematic PU, making this the second highest predictor of problematic PU in our sample. The only study that evaluated the association between these two variables had specified that individuals who more frequently mobilize experiential and emotional avoidance strategies were those with more PU.³⁰ In a broader perspective, earlier research postulated that difficulties in emotion regulation are associated with higher incidence of addictive behaviors,²⁷ being able to contribute to compulsive sexual behavior,²⁴ that may include the problematic use of pornography. Mood modification and tolerance are two core dimensions of problematic PU, referring, respectively, to the subjective experience consequent to PU, and to the increased frequency of PU required to maintain initial effectiveness.¹⁷ Our non-clinical sample comprises individuals with a moderate average score of difficulties in emotion regulation and predominantly reflects a non-problematic PU. Thus, the previous evidence regarding the link between out-of-control sexual behaviors and difficulties in emotion regulation should be compared with caution. However, according to the self-medication theory originally developed to explain addictive vulnerability to substance use,^{55,56} we can

hypothesize that pornography use can also be a self-medication strategy, used to cope with psychological distress related to difficulties in emotion regulation.

Difficulties in emotion regulation may result from the need to manage dysphoric or unpleasant states, which include experiences of loneliness. Moreover, lonelier individuals experience predominantly negative affect (eg, desperation, self-depreciation, boredom, depression),³⁹ and use fewer adaptive emotion regulation strategies, than those who are socially connected.³³ In our study, loneliness is the third predictor of problematic PU, which is in accordance with the previously suggested compensatory effect of PU on the lack of social connection.⁴¹

The type of loneliness experienced contributes to the activation of different coping responses: individuals with a higher perception of a lack of social relationships may demonstrate more passive coping strategies, while those with a higher perception of deficits in their intimate attachments reveal more active coping strategies, namely seeking emotional support and making an effort to develop new relationships.⁵⁷ Therefore, PU emerges as a coping strategy in the face of loneliness (particularly social loneliness) and the difficulties to regulate it. Although pornography is used to cope with or avoid unpleasant emotional states such as loneliness, paradoxically this behavior leads to a rise of adverse emotions over time,³⁰ and is often considered a maladaptive strategy.²⁸

As mentioned before, our results showed a significant correlation between perceived stress and problematic PU. Although pornography is not exclusively available in digital formats, the easy accessibility, anonymity, and affordability of the Internet,⁵⁸ seem to have strengthened PU as a strategy for stress reduction.¹⁹ However, perceived stress did not reveal any predictive value in the regression model. We hypothesized that difficulties in emotion regulation and stress are two closely related constructs, with stress being overshadowed by difficulties in emotion regulation. In line with this perspective, emotion dysregulation has been seen as a transconceptual and transdiagnostic construct.²⁴ Although the impact of stress on the ability to regulate psychophysiological states is recognized,⁴³ emotion regulation could be understood as an umbrella for several other variables, including stress. At the same time, there are several behaviors that promote a transitory stress relief, but that may also induce long term emotion dysregulation.²¹ PU, particularly when problematic, can contribute to this vicious cycle,^{19,28} reinforcing the greater explanatory power of the difficulties in emotion regulation compared to perceived stress.

Even though we found age positively correlated to problematic PU, in the regression model this demographic variable was not shown to be predictive of problematic PU, which is in line with prior research.⁶ For reasons that may be methodological, socio-cultural, moral, or others, age has shown inconsistent results in previous research (see, for an example of divergent findings).^{59,37}

Although our main premises were supported, the study has several limitations. Our sample is a community-based sample, consisting mostly of young age, single men with low PU. In fact, the great majority of participants showed a recreational PU, reporting no problematic levels of PU. The descriptive results indicate that these individuals also reported low to moderate values of difficulties in emotion regulation, loneliness, and perceived stress. These characteristics do not allow these results to be generalized to the population of individuals with PU.

This is a correlational study, precluding causal conclusions. In other words, it is unclear whether difficulties in emotion regulation and loneliness are the cause of PU. However, and as mentioned above, there is an evidence of a back-effect of PU on difficulties in emotion regulation,²⁸ which is in turn potentiated by moral incongruence.³² Concurrently, as previously hypothesized,¹⁹ PU motivations may change over time, in response to life circumstances. Longer-term longitudinal studies are needed to examine further bidirectional associations between difficulties in emotion regulation, loneliness, and problematic PU, and how they could change over time. Exploring the mediating role of difficulties in emotion regulation in the relationship between loneliness and problematic PU over time is also suggested for further studies. A third and important limitation of our study is that the regression model, despite being significant, showed a reduced proportion of explained variance of problematic PU, indicating that in future studies other regression models may include other emotional variables with an expected motivational role in PU, and mainly in the development of problematic PU. Finally, it is important to highlight that our variables were assessed with self-report measures, which may have limited the evaluation of problematic PU, difficulties in emotion regulation, perceived stress and, in particular, loneliness. Loneliness can be considered a multidimensional phenomenon,⁶⁰ and therefore, the assessment of the construct through a unidimensional questionnaire may be inadequate since it limits the understanding of the experience of loneliness. The use of qualitative methods to assess the experiences of loneliness, as well as those of PU, is therefore recommended.

Despite these limitations, the current study provides a better understanding of PU motivations related with the reduction or avoidance of unpleasant states. Studied simultaneously, difficulties in emotion regulation, loneliness, and perceived stress provide a better understanding of the complex relationships between these factors and problematic PU. Our findings, although cross-sectional, showed that difficulties in emotion regulation and loneliness are predictors of higher problematic PU, as well as the expected gender effect.

Regarding the clinical implications, the findings of this study suggest that the potential presence of psychological vulnerabilities associated with emotion regulation, stress management and coping skills, particularly in pornography users with problematic use or compulsive sexual behavior disorder, should be considered and assessed. In these cases, an approach that includes the identification of negative emotional experiences that trigger problematic PU, as well as the promotion of better emotion regulation

abilities, including strategies for adaptive coping with loneliness, seems to be appropriate. Considering the widespread nature of PU, ranging along a continuum from healthy to problematic, and the potential diversity of its impacts,⁶¹ different and integrative therapeutic approaches will be needed.^{62,63}

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Conflict of Interest: The authors report no conflicts of interest.

Funding: This work was supported by national funds through the FCT - Foundation for Science and Technology, I.P., under the project [UIDB/04585/2020](https://doi.org/10.1007/s10508-010-9644-x).

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