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Claudio Vieira & Mark D. Griffiths

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# Problematic Pornography Use and Mental Health: A Systematic Review

Claudio Vieira  and Mark D. Griffiths

Psychology Department, Nottingham Trent University, Nottingham, United Kingdom

## ABSTRACT

The present review aimed to synthesize the empirical evidence regarding the association between problematic pornography use (PPU) and mental health. A comprehensive literature search using keywords and subject headings was performed with three electronic databases, resulting in 20 studies that met the inclusion criteria. The patterns of association between PPU and mental health were examined, and the limitations of these studies were discussed. The overall findings suggest the relationship between PPU and mental health outcomes is not clear-cut, and it is often mediated by other factors such as loneliness, anxiety, and self-esteem. Further studies are required to evaluate the prevalence of PPU and both risk and protective factors which are associated with exposure to online pornography. Most studies relied on homogenous samples which have limited the generalizability of findings. The use of representative samples, including both males and females with different sexual orientations and from diverse cultural and ethnic backgrounds, would strengthen our understanding of PPU and go further to expound on its controversies. Clinical recommendations and future directions are also discussed.


## KEYWORDS

Problematic pornography use; behavioural addictions; pornography addiction; addiction; mental health

## INTRODUCTION

Problematic pornography use (PPU) has become an area of increasing research interest over the past two decades. The United States (US) has one of the largest markets for pornography with 60% of all websites holding pornographic material hosted in the United States (Statista, 2023a). In 2022, the pornography industry in the US was estimated to have a value of almost \$977 million (US). It was projected that in 2023, the industry would exceed \$1 billion (US) in value, with an annualized market growth of 12.6%, representing an increase of approximately 58% compared to 2018 (Statista, 2023b).

**CONTACT** Claudio Vieira  [Claudio.Vieira@nhs.net](mailto:Claudio.Vieira@nhs.net)  Psychology Department, Nottingham Trent University 50 Shakespeare Street, Nottingham NG1 4FQ, United Kingdom

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## **Prevalence**

The number of individuals negatively impacted by pornography has been difficult to establish, given both the privacy associated with its consumption and the fact that consumers may not necessarily associate their pornography use with mental health outcomes. To date, several studies that have attempted to estimate its prevalence. For example, two studies conducted in 2016 (Wéry & Billieux, 2016; Kraus, Martino, & Potenza, 2016) estimated the prevalence of PPU among adult male porn users. The study by Wéry and Billieux (2016) included 511 participants (44.7% Belgian, 35.3% French, 16.1% Canadian, and 3.9% other nationalities), and Kraus, Martino, et al. (2016) had a sample of 1,298 adult males (81% from the US, 8% from Canada, and 11% from other English-speaking countries). Both studies reported a prevalence rate of 28% for PPU. Pornography consumption has also become an increased problem among adolescents. Wright, Herbenick, and Paul (2020) reported that 68.4% of adolescents (aged 14–18 years) in the US had been exposed to online pornography, whereas Wolak, Mitchell, and Finkelhor (2007) estimated that 42% of youth (aged 10–17 years) had been exposed online pornography.

In the UK, Ofcom (2021) reported that half (49%) of the adult population (26 million unique adult visitors) had visited adult websites and/or apps in September 2020. Furthermore, the report suggested that the website *Pornhub* was visited by 15 million UK adults in September 2020 alone, indicating an increase of one million individuals compared to the previous year. With regards to the demographics, the report indicated that 55% of young adults (aged 18–24 years) visited *Pornhub* in September 2020. It was also reported that half of all UK adult males had visited *Pornhub* in that period, compared to 16% adult females. Moreover, a study by Sabina, Wolak, and Finkelhor (2008) highlighted that early exposure (before the age of 13 years) to online pornography was uncommon (14.4%). Data collected in 2011 suggested that early exposure to online pornography content had increased to 48.7% (Sun, Bridges, Johnson, & Ezzell, 2016).

## **Problematic Pornography Use and Mental Health Outcomes**

PPU is an umbrella term that describes persistent difficulties in reducing or controlling pornography use despite negative outcomes regarding personal, relational and/or occupational functioning (Ince, Yücel, Albertella, & Fontenelle, 2021). PPU has been subject to both empirical research and public attention (Arterburn & Martinkus, 2014; Harkness, Mullan, & Blaszczyński, 2015; Peter & Valkenburg, 2016). During the COVID-19 pandemic, there was an increase in the consumption of online pornography, with variations ranging from 4% to 24% across 27 different countries (Gjoneska et al., 2022; PornHub, 2020).

Gjoneska et al. (2022) hypothesized that such an increase in online pornography use may be due to pornography being used as a replacement for other addictive substances and compulsive behaviors (such as alcohol, drugs, and compulsive sexual activities with partners) that may have become less available during the pandemic, due to restrictive measures.

Several studies have examined perceived addiction to online pornography, as opposed to diagnosed pornography addiction. Self-perceived PPU (SPPPU) can be defined as the individual's propensity to report distressing feelings associated with their compulsive use of pornography (Grubbs, Volk, Exline, & Pargament, 2015). SPPPU has been associated with a wide range of mental health outcomes, including relationship anxieties (Leonhardt, Willoughby, & Young-Petersen, 2018), psychological distress (Grubbs et al., 2015; Vaillancourt-Morel et al., 2017), alcohol use (Morelli, Bianchi, Baiocco, Pezzuti, & Chirumbolo, 2017), and problematic gaming (Bóthe, Tóth-Király, & Orosz, 2015). However, Grubbs, Wilt, Exline, and Pargament (2018) have suggested that despite the fact that SPPPU may at times be a realistic form of self-appraisal, it might not always be an accurate self-view, due to the influence of moral scruples regarding pornography use. The authors argue that for individuals with strong religious beliefs, pornography consumption may reflect a violation of such core ideas, resulting in shame and cognitive dissonance. As a result, these individuals may be more prone to hold a pathological view of themselves and view themselves as addicted to pornography.

However, Ince et al.'s (2021) findings contradicted the importance of both religious and moral disapproval of pornography toward self-perceived PPU, particularly among clinical samples. The findings from their study (i) confirmed the relevance of comorbidity within PPU, and (ii) indicated positive associations between depression, anxiety, and PPU. However, no significant association was found between impulsivity and compulsivity scores, or severity of PPU.

In contrast to studies outlining the negative impact of engaging in online pornography use, some authors (e.g., McKeown, Parry, & Light, 2018) have suggested that pornography use can have a positive impact on an individual's overall well-being, by allowing the exploration and normalization of sexual desires. Although the consumption of pornography is not problematic on its own, a proportion of the general population perceived their use of pornography as problematic which, in turn, leads to psychological distress, as well as an impact on both social and vocational functioning (Sniewski, Farvid, & Carter, 2018; Twohig & Crosby, 2010).

A qualitative study by Palazzolo and Bettman (2020) examined the lived experiences of individuals with SPPPU and found that SPPPU was associated with significant personal suffering and with a negative impact on both mental health and relationship satisfaction. Moreover, individuals reported an experience of dependency which was similar to experiences described by individuals with substance addiction. Their findings highlighted that for many

individuals, the experience of compulsive online pornography use was difficult to curtail, despite the negative outcomes on their lives. Participants reported mental health difficulties associated with their problematic use of internet pornography, including depression, anxiety, self-isolation, and low self-esteem. This was consistent with a study by Harper and Hodgins (2016) which indicated that while the consumption of internet pornography itself was not associated with symptoms of psychological difficulties and mental health problems, the daily use of online pornography was associated with higher scores on measures concerning negative outcomes of mental health variables.

### ***Problematic Pornography Use and Executive Functioning***

Whether PPU constitutes an addiction remains open for debate within the scientific community (Duffy, Dawson, & das Nair, 2016; Kraus, Martino, et al., 2016). When the fifth edition of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-5) was last updated in 2013, the American Psychiatric Association did not formally categorize internet porn addiction, initially opting instead to conceptualize the umbrella of “hypersexual disorder,” to include problematic sexual behaviors. Such a term was endorsed for inclusion by the chairs of all the DSM-5 Work Groups. However, this was later rejected by DSM-5 summit officials (Hajela & Love, 2017). Alongside this, the eleventh revision of the International Classification of Diseases (ICD-11) included Compulsive Sexual Behavior Disorder (Kraus et al., 2018; World Health Organization, 2020), defining it as an impulse control disorder characterized by a persistent pattern of failure to control intense, repetitive sexual urges and behaviors where an individual (i) dedicates excessive time to sexual activities to the point of disregarding health, personal care, interests, and responsibilities, (ii) experiences reduced control manifested by multiple unsuccessful efforts to reduce sexual behavior, (iii) continues sexual activity despite negative outcomes, (iv) continues engagement in sexual behavior even when little or no satisfaction is experienced, and (v) experiences significant distress or impairment across life domain, including occupational, social, and educational areas of functioning.

A few studies have examined the association between hypersexuality and specific executive functions of the brain (e.g., impulse control and affect regulation) among hypersexual patients, especially those presenting without organic brain pathology, head trauma, or neurological/psychiatric diagnoses (Stuss & Alexander, 2000; Alvarez & Emory, 2006). Reid, Karim, McCrory, and Carpenter (2010) investigated the differences between a group of hypersexual patients ( $n=87$ ) and a non-hypersexual community sample ( $n=92$ ) of men using the Behavior Rating Inventory of Executive Function-Adult Version (BRIEF-A). The findings of the study suggested

that hypersexual behavior was positively associated with global indices of executive dysfunction and several subscales of the BRIEF-A, supporting the hypothesis that executive dysfunction may be implicated in hypersexual behavior. In line with this, Laier, Schulte, and Brand (2013), with a sample of 28 healthy adult men, investigated the impact of pornographic picture processing on working memory performance. Participants were invited to perform four experimental manipulations of a pictorial 4-back working memory task with neutral, negative, positive, or pornographic stimuli. Participants were also asked to rate 100 pornographic images concerning sexual arousal and to indicate masturbation urges before and following the exposure to pornographic material. The main findings suggested poorer working memory performance in the pornographic picture condition of the 4-back task compared with the other three picture conditions. These results were consistent with previous studies examining the impact of sexual stimuli on cognition (e.g., Most, Smith, Cooter, Levy, & Zald, 2007).

### ***Aim of the Review***

Despite the growing number of studies exploring the relationship between PPU and mental health outcomes, the findings remain unclear and inconsistent. Therefore, the present systematic review aimed to synthesize the literature associated with the relationship between PPU and mental health, highlighting the role of mediating factors, including religiosity, loneliness, and self-esteem.

## **METHOD**

### ***Data Sources and Strategy***

The review was guided by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) recommendations (Moher et al., 2015). The search strategy for this paper involved reviewing electronic databases and bibliographic references of retrieved papers. A comprehensive literature search of English language papers in *OneSearch* (the authors' university search engine which includes many databases including *Scopus*) *PubMed*, and *ProQuest* was conducted. The present review was pre-registered with PROSPERO in May 2023 and the literature search was conducted June 10–16, 2023. It involved reviewing electronic databases and bibliographic references of retrieved papers.

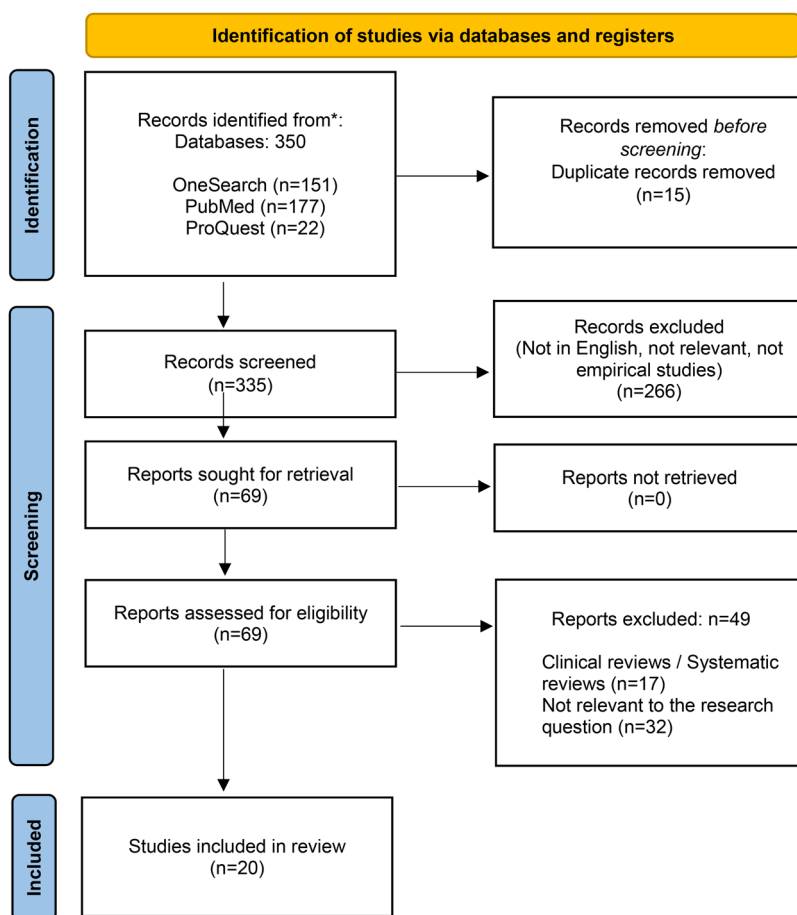
Reference lists from each study found in the database were also evaluated until no new studies could be found. A combination of the following terms was used to search each database: (“problematic pornography” OR “pornography addiction” OR “compulsive pornography use” AND (“mental health” OR anxiety OR depression OR self-esteem OR stress OR distress).

The search of electronic databases identified a total of 350 papers, with 335 remaining after removing duplicates. Following the initial screening against the inclusion criteria, 66 papers proceeded to full-text review. After a full-text review, seven papers were excluded. A final total of 20 studies were subsequently included in the review.

Following best practice guides (Siddaway et al., 2019), the present review went through several stages to guarantee a high-quality review. These stages were: (i) formulating research questions, (ii) identifying relevant literature, (iii) assessing literature eligibility, (iv) analyzing eligible literature, and (v) reporting the results of the review. A PRISMA flowchart of the search strategy, depicting the selection of papers, is presented in Figure 1.

### **Inclusion and Exclusion Criteria**

Papers were reviewed for meeting the following inclusion criteria. These were that the studies (i) assessed the relationship between pornography addiction/PPU and mental health; (ii) were published in English and a



**Figure 1.** PRISMA flowchart of the study selection process. Based on guidelines by Page et al. (2021).

peer-reviewed journal; and (iii) contained empirical primary data. Publications were not excluded based on research design (i.e., experimental) or target population (i.e., clinical, or non-clinical; male or female). The exclusion criteria were studies: (i) not published in English; and (ii) where the output was a review paper, meta-analysis paper, conference abstract, poster paper, letter, commentary, or editorial.

### **Study Selection and Data Extraction**

Paper selection initially resulted in 151 papers from *OneSearch*, 177 papers from *PubMed*, and 22 papers from *ProQuest*. Titles and abstracts of all search results were reviewed for inclusion. If a paper was deemed potentially relevant, full-text copies were attained and compared against the eligibility criteria. The search resulted in 20 studies meeting the inclusion criteria. The following data were extracted from the 20 studies: sample characteristics (e.g., sample size, gender breakdown, country of study, etc.), measures (i.e., screening instruments used), and key findings.

### **Quality Assessment of Included Studies**

The methodological quality of the full-text studies was assessed using the Newcastle-Ottawa Quality Assessment Scale, adapted for cross-sectional studies. The first author rated the methodological quality criteria individually and these were discussed and agreed upon with the other author. The authors used a modified Newcastle-Ottawa Quality Assessment scale adapted for cross-sectional studies, which comprised seven criteria to assess quality ([Supplementary File 1](#)). For five criteria, a score of 1 was endorsed for fully meeting the criterion and a score of 0 for not meeting the criterion. For the remaining two criteria, a score of 2 was endorsed for fully meeting the criterion, a score of 1 for partly meeting the criterion, and 0 for not meeting the criterion. The methodological quality score was calculated for each study by summing the total score of all relevant criteria and dividing it by the total possible score. With a possible maximum score of 9, 13 studies had a total score of 6, two studies had a total score of 5, and the remaining five had a total score of 7. Studies with a score higher than 6 were deemed high-quality papers.

## **RESULTS AND PRELIMINARY DISCUSSION**

### **Overview of Included Studies**

[Table 1](#) provides an overview of included studies. All studies were published over the past 21 years, with the majority being over the last 5 years ( $n=13$ ). The total number of participants across all studies was 23,791, comprising both male and female participants (15,143 males and 8,648 females).



**Table 1.** Overview of included studies ( $n = 20$ ).

Authors	Aims	Sample	Measures	Key Findings
Bibi, Fatima, Amin, and Rowland (2002)	To examine potential cognitive and affective factors that could help explain the maintenance and exacerbation of self-defined problematic internet pornography use.	280 Pakistani participants, 123 women and 157 men, (mean age = 25.40; SD = 5.271, range 18–50)	Depression Anxiety and Stress Scale-21 (DASS-21) Rosenberg Self-Esteem Scale The 6-Item De Jong Gierveld Loneliness Scale Pornography Craving Questionnaire (PCQ) Hypersexual Behavior Inventory-19 (HBI-19)	Craving mediated the relationship between three predisposing variables (depression, anxiety, and self-esteem) and PPU, though not the fourth, namely loneliness. Indirect effects of depression, anxiety, and self-esteem were significantly linked to PPU through two serial mediation pathways: (i) craving and stimulus-specific inhibitory control, and (ii) craving and dysfunctional sexual coping.
Borgogna, Lathan, and Mitchell (2018)	To explore the role of problematic pornography viewing constructs, body image, and relationship satisfaction	949 adult university women in the southeastern US	Brief Pornography Screening (BPS) Pornography viewing frequency (designed by researchers) Problematic Pornography Use Scale (PPUS) Body Parts Satisfaction Scale-Revised (BPSS-R) Relationship Assessment Scale (RAS)	Structural equation modeling indicated problematic pornography viewing frequency, perceptions of excessive use, and control difficulties were unrelated to body image or relationship satisfaction. However, PPU to escape negative emotions significantly predicted participants' body image and relationship dissatisfaction.
Borgogna, Kraus, and Grubbs (2022)	To explore whether differences exist between veteran and non-veteran men on indices of PPU, determine whether veteran status is associated with an exacerbation of psychological distress in conjunction with PPU, and establish measurement invariance psychometric data between veteran and non-veteran men on the Brief Pornography Screen	844 US males (N = 658 non-veterans, N = 186 veterans)	Brief Pornography Screening (BPS) Level 1 Cross-Cutting Symptom Measure Pornography Viewing Frequency (designed by researchers)	When adjusting for age, veteran men experienced significantly more PPU compared to non-veteran men. A substantial moderation effect was also evident, with veterans experiencing significantly more psychological distress associated with their PPU ( $\beta = .65$ ) compared to non-veterans ( $\beta = .29$ ), while adjusting for age and pornography use frequency.

(Continued)

**Table 1.** Continued.

Authors	Aims	Sample	Measures	Key Findings
Bóthe, Tóth-Király, Potenza, Orosz, and Demetrovics (2020)	To identify profiles of pornography use based on the frequency of pornography use and PPU by applying a person-centered analytic approach and to examine whether the identified profiles could be distinguished based on theoretically relevant demographic and psychological constructs	Three Hungarian nonclinical samples were recruited from general websites and a pornography site. Study 1 – N = 14,006 (females = 4,185, 30.0%) Study 2 – N = 483 (females = 252, 52.2%) Study 3 – N = 672 (females = 43, 6.4%)	Problematic Pornography Consumption Scale (PPCS) Sexual Dysfunction Scale Sexual Abuse History Questionnaire Hypersexual Behavior Inventory UPPS-P Impulsive Behavior Scale Structured Clinical Interview for DSM-IV (SCID-II) ADHD Self-Report Scale 15-item Big Five Inventory-2 Perceived Stress Scale Cognitive and Affective Mindfulness Scale-Revised Satisfaction With Life Scale Rosenberg Self-Esteem Scale Center for Epidemiological Studies Depression Scale Brief Sensation Seeking Scale The Basic Psychological Need Satisfaction and Frustration Scale	Results were consistent across all studies. Three distinct pornography-use profiles emerged: nonproblematic low-frequency pornography use (68–73% of individuals), nonproblematic high-frequency pornography use (19–29% of individuals), and problematic high-frequency use (3–8% of individuals). Nonproblematic and problematic high-frequency-use groups showed differences in several constructs (i.e., hypersexuality, depressive symptoms, boredom susceptibility, self-esteem, uncomfortable feelings regarding pornography, and basic psychological needs).
Brand et al. (2011)	To examine potential predictors of a tendency toward cybersex addiction in terms of subjective complaints in everyday life due to online sexual activities.	89 adult German men	Internet Addiction Test (IAT). Internet Addiction Test adapted for online sexual activities (s-IAT-sex) Symptom Check List (SCL-90-R) Shyness and Sociability Scales Behavioral Approach System (BAS) and Behavioral Inhibition System (BIS) scales	A positive relationship between subjective sexual arousal when watching internet pornographic pictures and the self-reported problems in daily life due to the excessiveness of cybersex as measured by the IATsex The global symptom severity (SCL GSI), as well as interpersonal sensitivity, depression, paranoid thinking, and psychoticism, were correlated particularly with the IATsex score. In contrast, time spent on cybersex sites (minutes per day) was generally unrelated to psychological symptoms. The actual time spent on cybersex sites was also not significantly correlated with the IATsex score.

*(Continued)*



Table 1. Continued.

Authors	Aims	Sample	Measures	Key Findings
Camilleri, Perry, and Sammut (2020)	To explore the potential relationship between compulsive use of pornography and mental health in university students.	University students (N = 1,031; 347 males, 684 females) from Franciscan University of Steubenville, Ohio.	Modified Compulsive Internet Use Scale (mCIUS) Emotional and Sexual States Questionnaire (EmSS) Depression, Anxiety, and Stress Scale (DASS-21)	56.6% of those surveyed reported lifetime pornography use, with a significantly higher proportion of males than females reporting such use. Most students reported accessing pornography through internet-related technologies. Additionally, 17.0, 20.4, and 13.5% of students reported severe or extremely severe levels of depression, anxiety, and stress, respectively, with compulsive pornography use significantly affecting all three mental health parameters in both sexes.
Chen, Ding, Jiang, and Potenza (2018)	To propose and test a model by which pornography craving may promote more frequent engagement in online sexual activities (OSAs) and more time spent engaging in OSAs, and this may lead to problematic OSAs and subsequent negative consequences like negative emotions.	1,070 Chinese college answers from 622 males and 448 females	Pornography Craving Questionnaire (PCQ) Internet Addiction Test adapted for OSAs (s-IAT-sex) Online Sexual Activities Questionnaire	20.63% of students were at risk of problematic OSA use, and this group had a greater frequency of OSA, more usage time, higher pornography cravings, and more negative academic emotions. Pornography craving was associated with problematic OSAs use more, so through frequency than the quantity of OSAs, and OSAs were associated with negative academic emotions.
Doornwaard, van den Eijnden, Baams, Vanwesenbeeck, and ter Bogt (2016)	To investigate whether factors from three distinct psychosocial domains (i.e., psychological well-being, sexual interests/behaviors, and impulsive-psychopathic personality) predicted symptoms of compulsive use of sexually explicit Internet material among adolescent boys.	331 Dutch boys (ages ranging from 11–17 years) indicated that they used sexually explicit Internet material.	Compulsive Internet Use Scale Depressive Mood List The Sexual Preoccupation subscale of Snell and Papini's Sexuality Scale Eysenck Impulsiveness Scale	Lower levels of global self-esteem and higher levels of excessive sexual interest concurrently predicted boys' symptoms of compulsive use of sexually explicit Internet material. Longitudinally, higher levels of depressive feelings and, again, excessive sexual interest predicted relative increases in compulsive use symptoms 6 months later.

(Continued)

Table 1. Continued.

Authors	Aims	Sample	Measures	Key Findings
Droubay et al. (2020)	To examine the roles of solitary sexual desire, moral incongruence, feelings of dysregulation, and shame-proneness in predicting subjective distress among consumers	559 US adults (55% male)	Cyber Pornography Use Inventory-9 (CPUJ-9) Sexual Desire Inventory-2 (SDI-2) Shame-Negative-Self-Evaluation (NSE) subscale of the Guilt and Shame Proneness Scale (GASP)	Sexual desire was positively associated with individuals feeling their pornography viewing was dysregulated, and the relationship was moderated by moral incongruence. For persons with moral qualms associated with pornography viewing, having a higher desire to view it may feel dysregulated in and of itself; for these individuals, merely possessing higher solitary sexual desire may be interpreted as pathological because they are repeatedly having impulses to engage in behavior that they believe is immoral. Results further suggest that the relationship between solitary sexual desire and subjective distress is fully mediated by feelings of dysregulation. This suggests that the association between sexual desire and subjective distress is fully dependent on participants' interpretation of their viewing. A higher level of internet pornography addiction was associated with poorer psychosocial functioning and problematic alcohol, cannabis, gambling, and video game use. A curvilinear association was found between the frequency of internet pornography use and the level of addiction such that daily or greater IP use was associated with a sharp rise in addictive IP scores.
Harper and Hodgins (2016)	To define problematic and non-PPU, and to show that this definition is dependent on the perspective that one adopts—mental health, feminist, and/or religious.	105 female and 86 male university students (mean age 21) from Calgary, Canada	Brief Symptom Inventory 18 Satisfaction With Life Scale Relationship Assessment Scale Alcohol Use Disorders Identification Test (AUDIT) Game Addiction Inventory for Adults (GAIA) Cyber-pornography uses inventory—compulsion measures.	The failure to find a strong significant relationship between internet pornography use and general psychosocial functioning suggests that the overall effect of IP use is not necessarily harmful in and of itself. Pornography use and religiosity were weakly associated with higher relationship anxiety surrounding pornography use, whereas perception of pornography addiction was highly associated with relationship anxiety surrounding pornography use. However, when the perception of pornography addiction was inserted as a mediator in a structural equation model, pornography use had a small indirect effect on relationship anxiety surrounding pornography use, and the perception of pornography addiction partially mediated the association between religiosity and relationship anxiety surrounding pornography use.
Leonhardt et al. (2018)	To assess how pornography use, religiosity, and perception of pornography addiction are intertwined with anxiety surrounding relationships.	686 nonmarried US individuals, who had used pornography (350 males, 336 females), sampled using Amazon Mechanical Turk (MTurk)	Sexual Compulsivity Scale Pornography use - assessed with a one-item measurement. Religiosity - assessed as a dichotomous variable based on high and low religiosity. Relationship anxiety surrounding pornography use was assessed as a latent variable comprising two separate subscales that were created for the study.	The failure to find a strong significant relationship between internet pornography use and general psychosocial functioning suggests that the overall effect of IP use is not necessarily harmful in and of itself. Pornography use and religiosity were weakly associated with higher relationship anxiety surrounding pornography use, whereas perception of pornography addiction was highly associated with relationship anxiety surrounding pornography use. However, when the perception of pornography addiction was inserted as a mediator in a structural equation model, pornography use had a small indirect effect on relationship anxiety surrounding pornography use, and the perception of pornography addiction partially mediated the association between religiosity and relationship anxiety surrounding pornography use.

(Continued)

Table 1. Continued.

Authors	Aims	Sample	Measures	Key Findings
Levi et al. (2020)	To investigate compulsivity, anxiety and depression and impulsivity, and problematic online sexual activities among adult males and females who use the Internet for finding sexual partners and using online pornography.	Study 1- 177 Israeli adults, including 143 females and 32 males. Study 2- 139 Israeli adults, including 98 females and 41 males.	The Spielberger Trait and State Anxiety Inventory (STAI) The Beck Depression Inventory (BDI). Yale-Brown Obsessive Compulsive Scale (YBOCS-) Sexual Addiction Screening Test (SAST)	Obsessive-compulsive symptoms contributed to sexual addiction among individuals who use the Internet for finding sexual partners. Impulsivity and problematic online sexual activity contributed to ratings of sex addiction. These studies support the argument that sex addiction lies on the impulsive-compulsive scale and could be classified as a behavioral addiction.
Levin, Lillis, and Hayes (2012)	To examine the relationship of Internet pornography viewing and experiential avoidance to a range of psychosocial problems (depression, anxiety, stress, social functioning, and problems associated with viewing)	157 male US undergraduate students	Acceptance and Action Questionnaire – II(AAQ-II) Depression Anxiety Stress Scale-21 (DASS) Social Functioning Questionnaire (SFQ)	Pornography viewing was significantly associated with greater viewing problems, depression, anxiety, and stress as well as poorer social functioning. Furthermore, pornography viewing continued to predict these variables, except for depression and stress, even after controlling for experiential avoidance. Experiential avoidance was found to moderate the relationship between viewing-to-viewing problems and anxiety, such that viewing was associated with these variables among individuals at clinical levels of experiential avoidance, but not among individuals at non-clinical levels of experiential avoidance.
Maddock, Steele, Esplin, Hatch, and Braithwaite (2019)	To examine the relationships among religiosity, self-perceived PPU, and depression over time.	320 US adults, 45.3% female, 54.8% male	Center for Epidemiologic Studies Depression Scale Revised (CESD-R-10) Religiosity (measure developed by the research team) Self-perceived PPU (measure developed by the research team) Excessive Use Subscale of the Problematic Pornography Use Scale	Religiosity was not associated with self-perceived PPU. For men, religiosity at baseline was associated with increased pornography use at 6 months. For both men and women, excessive pornography use at 3 months was associated with increased depression at 6 months. For men, depression at baseline was associated with self-perceived PPU at 3 months. For women, higher self-perceived PPU at three months predicted a lower frequency of pornography use and higher depression at 6 months.

(Continued)

**Table 1.** Continued.

Authors	Aims	Sample	Measures	Key Findings
Musetti et al. (2022)	To explore the associations between problematic online pornography use (POPU), psychological stress, emotion dysregulation, and insomnia symptoms and to understand the mediating role of psychological stress and emotion dysregulation in the relationship between POPU and insomnia symptoms.	776 Italian adults aged 19–48 years (399 males)	Cyber Pornography Addiction Test (CYPAT) Difficulties in Emotion Regulation Scale (DERS) Depression Anxiety Stress Scales-21 (DASS-21-S) Insomnia Severity Index (ISI)	After controlling for demographic covariates and COVID-19-related variables, the multiple mediation model showed that higher psychological stress and emotion dysregulation fully mediated the link between POPU and insomnia. The findings emphasized the significance of the negative consequences of POPU and underline the importance of working on this and its effects on psychological stress and emotion dysregulation to limit insomnia.
Niaozf, Weizman, and Weinstein (2019)	To investigate the relationships between ADHD, attachment style, sensation seeking, and problematic use of pornography online in the general population.	85 Israeli adults: 38 males (44.7%) and 47 females (55.3%)	Experience in Close Relationship Scale (ECR) Cyber Pornography Use Inventory (CPU) Sensation Seeking Scale (SSS)	Individuals with self-reported ADHD had higher scores of avoidant attachments on the ECR and CPU compared with individuals without ADHD. The multivariate linear regression analysis has indicated that male gender, ADHD, and anxious attachment to the ECR contributed significantly to the variance of cyber pornography use and explained 34% of the variance.
Okabe, Takahashi, and Ito (2021)	To identify the characteristics of PPU among Japanese students. Specifically, we examined general psychopathological symptoms, sexual compulsivity, depression, anxiety, and low effortful control.	150 college students (86 males: 64 females) at a university in midland Japan.	Sexual Compulsivity Scale (SCS) Patient Health Questionnaire (PHQ-9) Generalized Anxiety Disorder Scale (GAD-7) Effortful control (EC) scale of the Adult Temperament Questionnaire	Most males (97%) and approximately one-third of females (35.9%) used pornography at least once in the past month. Some users reported significant daily life problems due to difficulty in controlling pornography use (5.7%). Participants with impaired control of pornography use had higher depression, anxiety, and sexual compulsivity, and lower effortful control than pornography users without impaired control.
Sommantico, Gioia, Boursier, Iorio, and Parrello (2021)	To verify the association between relationship satisfaction, body image, depression, and self-perceived PPU (SPPPU) in Italian gay/bisexual men. Also, to explore the possible associations between relationship satisfaction, body image, depression, and SPPPU and to examine the possible indirect effects of depression, <i>via</i> relationship satisfaction, on SPPPU,	158 Italian males	Gay and Lesbian Relationship Satisfaction Scale (GLRSS) Male Body Attitudes Scale-Revised (MBAS-R) Beck Depression Inventory-II (BDI-II) Cyber Pornography Addiction Test (CYPAT)	Relationship satisfaction was inversely associated with male body image, self-perceived PPU, and depression. Depression, <i>via</i> relationship satisfaction, was associated with self-perceived PPU.

(Continued)

Table 1. Continued.

Authors	Aims	Sample	Measures	Key Findings
Tan et al. (2022)	To investigate the relationship between internet pornography use and psychological distress among emerging adults and the moderating role of gender in the association.	144 Malaysian emerging adult pornography users (91 males; 53 females)	Kessler Psychological Distress Scale (K-6) Problematic Pornography Consumption Scale (PPCS)	On self-reported IPU using Western samples, males were more likely to report problematic IPU. The findings of the study are contrary to findings from past studies. Past studies indicated that males and females experience different psychological distress. The study did not find any significant gender difference in psychological distress. Gender is a significant moderator between Internet pornography use and psychological distress. The females were found to be more psychologically affected by their problematic Internet pornography use than the males.
Wetterneck, Burgess, Short, Smith, and Cervantes (2012)	The current study further examined the relationship between problematic IP use and sexual compulsivity, impulsivity, and experiential avoidance	494 US adults (69.2% female; $n=342$ )	Pornography Consumption Effects Scale (PCESES) Sexual Compulsivity Scale (SCS)  Impulsivity, Risk-Taking Sensation Seeking Scale (IRTSS) Sexual Symptom Assessment Scale (S-SAS) Acceptance and Action Questionnaire-II (AAQ-II)	Individuals who were more sexually compulsive tended to be more impulsive, to be more likely to use avoidant coping methods, and to experience more sexual urges.  Those who reported more sexual compulsivity and impulsivity also tended to report both higher negative and positive effects of IP use. Impulsivity was significantly positively correlated with sexual urges and positive and negative perceived effects of IP use. High levels of experiential avoidance were associated with increases in sexual urges and more negative effects from IP use. Individuals who endorsed more sexual urges also reported more positive and negative perceived effects of IP use.

### **Country Location of Studies**

Most of the studies in the present review were conducted in the USA ( $n=8$ ). Other countries included Pakistan ( $n=1$ ), Hungary ( $n=1$ ), Germany ( $n=1$ ), China ( $n=1$ ), The Netherlands ( $n=1$ ), Canada ( $n=1$ ), Israel ( $n=2$ ), Italy ( $n=2$ ), Japan ( $n=1$ ), and Malaysia ( $n=1$ ).

### **Design**

All studies were cross-sectional ( $n=20$ ). No randomized control trials were identified.

### **Sample**

Sample sizes ranged from 89 to 14,003 participants. Considering the heterogeneous nature of sample characteristics across populations (e.g., students, clinical/non-clinical settings, and specific locations), the generalizability of findings are limited.

### **Measures**

Overall, studies used a variety of measures to assess pornography addiction/PPU and mental health. To assess PPU, a wide range of assessment tools were employed. These were the Brief Pornography Screening (BPS) ( $n=2$  studies) (Kraus et al., 2020), Compulsive Internet Use Scale ( $n=1$ ) (Meerkerk, Van Den Eijnden, Vermulst, & Garretsen, 2009), Cyber Pornography Addiction Test (CYPAT) ( $n=2$ ) (Cacioppo et al., 2018), Cyber Pornography Use Inventory (CPUI) ( $n=3$ ) (Grubbs, Sessoms, Wheeler, & Volk, 2010), Excessive Use Subscale of the Problematic Pornography Use Scale ( $n=1$ ) (Kor et al., 2014), Hypersexual Behavior Inventory ( $n=2$ ) (Reid, Li, Gilliland, Stein, & Fong, 2011), Internet Addiction Test (IAT) ( $n=1$ ) (Widyanto & McMurrin, 2004), Modified Compulsive Internet Use Scale (mCIUS) ( $n=1$ ) (Downing, Antebi, & Schrimshaw, 2014), Modified Internet Addiction Test to include online sexual activity and internet sex sites—IATsex ( $n=2$ ) (Wéry, Burnay, Karila, & Billieux, 2016), Online Sexual Activities Questionnaire ( $n=1$ ) (Zheng & Zheng, 2014), Pornography Craving Questionnaire (PCQ) ( $n=2$ ) (Kraus & Rosenberg, 2014), Problematic Pornography Consumption Scale (PPCS) ( $n=2$ ) (Böthe et al., 2018), Problematic Pornography Use Scale (PPUS) ( $n=1$ ) (Chen & Jiang, 2020), Sexual Addiction Screening Test (SAST) ( $n=1$ ) (Hook, Hook, Davis, Worthington, & Penberthy, 2010), and Sexual Compulsivity Scale (SCS) ( $n=1$ ) (Kalichman & Rompa, 1995). In relation to instruments to assess mental health and mental well-being related variables (e.g., self-esteem, insomnia, impulsivity), Table 2 provides an overview of the psychometrics used in the included studies



**Table 2.** Overview of psychometric instruments used to assess mental health outcomes included in the studies.

Domain	Psychometrics
Addiction	Alcohol Use Disorders Identification Test (AUDIT) (Babor, Higgins-Biddle, Saunders, & Monteiro, 2001) ( <i>n</i> = 1)
Anxiety distress/Stress	Game Addiction Inventory for Adults (GAI) (Wong & Hodgins, 2013) ( <i>n</i> = 1) Generalized Anxiety Disorder Scale (GAD-7) (Löwe et al., 2008) ( <i>n</i> = 1) Kessler Psychological Distress Scale (K-6) (Prochaska, Sung, Max, Shi, & Ong, 2012) ( <i>n</i> = 1) Perceived Stress Scale (Cohen, Kamarck, & Mermelstein, 1983) ( <i>n</i> = 1) Shyness and Sociability Scales (Asendorpf, 1997) ( <i>n</i> = 1) the Spielberger Trait and State Anxiety Inventory (STAI) (Spielberger, 1989) ( <i>n</i> = 1)
Depression low mood/Shame	Yale-Brown Obsessive Compulsive Scale (YBOCS) (Goodman et al., 1989) ( <i>n</i> = 1) Beck Depression Inventory II (BDI-II) (García-Batista, Guerra-Peña, Cano-Vindel, Herrera-Martínez, & Medrano, 2018) ( <i>n</i> = 2) Center for Epidemiologic Studies Depression Scale Revised (CESD-R-10) (Williams, Li, & Hay, 2020) ( <i>n</i> = 1) Depression Anxiety and Stress Scale-21 (DASS-21) (González-Rivera, Pagán-Torres, & Pérez-Torres, 2020) ( <i>n</i> = 3) Depressive Mood List, Difficulties in Emotion Regulation Scale (DERS) (Hallion, Steinman, Tolin, & Diefenbach, 2018) ( <i>n</i> = 1) Patient Health Questionnaire (PHQ-9) (Kroenke, Spitzer, & Williams, 2001) ( <i>n</i> = 1) Rosenberg Self-Esteem Scale (Rosenberg, 1979) ( <i>n</i> = 2) Satisfaction with Life Scale (Diener, Emmons, Larsen, & Griffin, 1985) ( <i>n</i> = 2) Shame-Negative-Self-Evaluation (NSE) subscale of the Guilt and Shame Proneness Scale (GASP) (Cohen, Wolf, Panter, & Insko, 2011) ( <i>n</i> = 1) the 6-Item De Jong Gierveld Loneliness Scale (De Jong Gierveld & Van Tilburg, 2010) ( <i>n</i> = 1)
General	15-Item Big Five Inventory-2 (Soto & John, 2017) ( <i>n</i> = 1) Acceptance and Action Questionnaire – II (AAQ-II) (Bond et al., 2011) ( <i>n</i> = 2) Basic Psychological Need Satisfaction and Frustration Scale (Liga et al., 2020) ( <i>n</i> = 1) Behavioral Approach System (BAS) and Behavioral Inhibition System (BIS) Scales (Carver & White, 1994) ( <i>n</i> = 1) Body Parts Satisfaction Scale-Revised (BPSS-R) (Petrie, Tripp, & Harvey, 2002) ( <i>n</i> = 1) Brief Symptom Inventory 18 (Recklitis, Blackmon, & Chang, 2017) ( <i>n</i> = 1) Cognitive and Affective Mindfulness Scale Revised ( <i>n</i> = 1) Insomnia Severity Index (ISI) (Morin, Belleville, Bélanger, & Ivers, 2011) ( <i>n</i> = 1) Male Body Attitudes Scale-Revised (MBAS-R) (Almeida et al., 2021) ( <i>n</i> = 1) Social Functioning Questionnaire (SFQ) (Tyrer et al., 2005) ( <i>n</i> = 1) Structured Clinical Interview for DSM-IV (SCID-II) (First & Gibbon, 2004) ( <i>n</i> = 1) Symptom Check List (SCL-90-R) (Franke, 2002) ( <i>n</i> = 1)
Impulsivity	ADHD Self Report Scale (Adler et al., 2006) ( <i>n</i> = 1), Brief Sensation Seeking Scale (Stephenson, Velez, Chalela, Ramirez, & Hoyle, 2007) ( <i>n</i> = 1) Effortful Control (EC) subscale of the Adult Temperament Questionnaire (Evans & Rothbart, 2007) ( <i>n</i> = 1) Eysenck Impulsiveness Scale (Eysenck, Pearson, Easting, & Allsopp, 1985) ( <i>n</i> = 1) Sensation Seeking Scale (SSS) (Schmidt, Molina, & Raimundi, 2017) ( <i>n</i> = 2) UPPS-P Impulsive Behavior Scale (Dugré, Giguère, Percie Du Sert, Potvin, & Dumais, 2019) ( <i>n</i> = 1)
Relationships	Experience in Close Relationship Scale (ECR) (Fraley, Waller, & Brennan, 2000) ( <i>n</i> = 1) Gay and Lesbian Relationship Satisfaction Scale (GLRSS) (Belous & Wampler, 2016) ( <i>n</i> = 1) Relationship Assessment Scale (RAS) II (Hendrick, Dicke, & Hendrick, 1998) ( <i>n</i> = 1),
Sexual domains	Sexual-Preoccupation subscale of Sexuality Scale (Snell & Papini, 1989) ( <i>n</i> = 1) Sexual Desire Inventory-2 (SDI-2) (Spector, Carey, & Steinberg, 1996) ( <i>n</i> = 1) Sexual Dysfunction Scale (Burwell, Case, Kaelin, & Avis, 2006) ( <i>n</i> = 1)

## **Statistical Analyses**

A wide range of statistical analyses were used across studies. The statistical analysis most used was correlation ( $n=10$ ), followed by structural equation modeling ( $n=7$ ), and regression ( $n=5$ ).

## **The Impact of Problematic Pornography Use on Mental Health Outcomes**

Nine studies examined the impact of PPU on mental health and wellbeing-related variables, including relationships and body image. Borgogna et al. (2018) examined the role of problematic pornography view in body image. Using a sample of 949 adult women, the authors hypothesized that viewing frequency would be negatively associated with body image and that all pornography viewing constructs (e.g., perception of excessive use and using pornography to manage or avoid negative emotions) would be inversely associated with it. Contrary to previous research (e.g., Albright, 2008) the findings from the study did not support the hypothesis that viewing frequency would be negatively associated with women's body image satisfaction. In relation to how specific problematic viewing constructs were associated with body image, the study indicated that pornography viewing as an avoidance strategy for negative emotions (e.g., shame, depression) was associated with the way participants perceived their body. However, this only accounted for a small proportion of the variance. In addition, the study suggested that neither problematic use, nor control difficulty problems, had any association with body image.

Another study by Borgogna et al. (2022) examined whether differences existed between veteran and non-veteran males on indices of PPU and whether veteran status was associated with an exacerbation of psychological distress in conjunction with PPU. The sample comprised 844 adult males (186 veteran males and 658 non-veteran males). The findings indicated that veterans experienced significantly more PPU, with higher scores on the Brief Pornography Scale than non-veterans. However, this discrepancy was non-significant. Further analyses also suggested that PPU was experienced disproportionately among younger veterans and the average viewing frequency over the past 12 months was non-significant between veterans and non-veterans. These outcomes appear to be consistent with previous studies on perceived pornography addiction (e.g., Grubbs, Exline, Pargament, Hook, & Carlisle, 2015a, b) that have indicated PPU can be present even if pornography use is not frequent. In contrast to the association between PPU and mental health, the study reported that perceived pornography addiction was strongly associated with increases in psychological distress among veterans compared to non-veterans. The relationship between scores on the Brief Pornography Scale and psychological distress appeared to be aggravated among veterans, possibly indicating that these males not only

experienced more PPU but also more mental health difficulties associated with the perceived pornography addiction compared to non-veterans.

Camilleri et al. (2020) examined the relationship between compulsive use of pornography and mental health with a sample of 1,031 university students. Consistent with previous research (e.g., Carroll et al., 2008), the study indicated a significant number of university students (56.6%) who reported lifetime pornography use, with a significantly higher proportion of males (87.6%) than females (40.9%) reporting such use. With regards to the association between PPU and psychological states, the study suggested that 17.0%, 20.4%, and 13.5% of students reported severe or extremely severe levels of depression, anxiety, and stress, respectively, with PPU significantly impacting all three mental health dimensions in both sexes. Camilleri et al. (2020) study also investigated potential protective factors that assist in decreasing compulsive pornography use. The findings highlighted the role of faith, morality, and personal motivation in efforts to reduce pornography use. This appears to be consistent with other studies (Fountoulakis & Gonda, 2019; O'Driscoll, Byrne, Byrne, Lambert, & Sahm, 2019), with higher levels of religiosity being associated with a lower frequency of pornography consumption (Perry & Hayward, 2017).

In line with the study of the role of faith and morality, Maddock et al. (2019) examined the relationship between religiosity, self-perceived PPU, and depression over time. With a sample of 340 adults (45.3% female, 54.8% male), the study found that neither religiosity nor the interaction between religiosity and pornography use predicted self-perceived compulsive pornography use at 3 months. The results suggested that more religious individuals who consumed pornography were equally as likely as less religious individuals who consumed pornography to perceive themselves as using pornography compulsively. This is not consistent with previous research that suggested that religious individuals are more likely than non-religious individuals to perceive themselves as addicted to pornography (Bradley, Grubbs, Uzdavines, Exline, & Pargament, 2016).

On the other hand, religiosity appeared to predict the frequency of pornography use among males (but not for females), suggesting that pornography use among males is impacted by religiosity. That is, despite previous studies (Short, Kasper, & Wetterneck, 2015) suggesting that more religious males are less likely to consume pornography, Maddock et al. concluded that religiosity was positively correlated with pornography viewing. In relation to mental health, Maddock et al. found that males with greater depressive symptoms were more likely to consume pornography compulsively at 3 months and to report more depressive symptoms at 6 months. However, among females, depressive symptoms were not associated with problematic pornography consumption at 3 months. In addition, females who reported higher self-perceived compulsive pornography viewing at 3 months reported less pornography use at 6 months.

Musetti et al. (2022) examined the association between PPU, psychological stress, emotional dysregulation, and insomnia with a sample of 776 adults (399 males). The study found a significant positive relationship between PPU and insomnia symptoms. However, mediation analyses indicated that this relationship occurred mainly in an indirect way. PPU was also associated with psychological stress, which is corroborated by other studies suggesting a relationship between problematic use of online sexual activities and symptoms of depression and anxiety (see Hermand et al., [2020] for a systematic literature review). Lastly, both problematic online pornography use and psychological stress were positively associated with emotional dysregulation, suggesting that individuals with PPU struggle with emotional coping strategies.

Okabe et al. (2021) also examined general psychopathological symptoms, sexual compulsivity, depression, anxiety, and low effortful control concerning PPU with 150 college students (86 males and 64 females). The study found that 5.7% of users ( $n=6$ ) reported significant daily life problems due to problems in managing pornography use. In addition, most males (97%) and nearly one-third of females (35.9%) consumed pornography at least once in the past month. In relation to mental health, participants with impaired control of pornography use showed higher levels of depression, anxiety, and sexual compulsivity, and lower effortful control than pornography users without impaired control. These findings were consistent with previous research in which problematic pornography users showed psychopathological symptoms (Brand et al., 2011; Grubbs et al., 2015a). The study also concluded that frequency of use was significantly associated with problematic use, but duration of use was not. That is, those who engage in PPU may not spend much time in actual use on a session-by-session basis.

Tan et al. (2022) investigated the relationship between internet pornography use and psychological distress among 144 emerging adults (91 males and 53 females) and the moderating role of gender in the association. As observed in previous research (e.g., Giordano & Cashwell, 2017), the study indicated that males were more likely to report problematic internet pornography use. However, Tan et al. (2022) noted that females who reported problematic internet pornography use experienced more psychological distress when compared to males who reported problematic internet pornography use.

Wetterneck et al. (2012) examined the relationship between problematic internet pornography use and sexual compulsivity, impulsivity, and experiential avoidance. With a sample of 494 adults (342 females), the findings indicated that most individuals had used internet pornography at some point in their lives (70.4%;  $n=348$ ), and just over half were currently using it (52.9%;  $n=184$ ). Consistent with a study by Shapira, Goldsmith, Keck, Khosla, and McElroy (2000) and with Mick and Hollander's (2006) model of sexual compulsivity, the findings suggested that time spent on online pornography

per week was associated with both compulsivity and impulsivity. Furthermore, the number of hours per week spent on online pornography appeared to be associated with the use of avoidance coping strategies or experiential avoidance, which concurs with previous studies indicating that experiential avoidance may maintain and/or aggravate compulsive (Twohig et al., 2010), impulsive (Flessner, Busch, Heideman, & Woods, 2008), and addictive behaviors (Stotts, Masuda, & Wilson, 2009). Lastly, a comparison between participants with problematic and non-problematic internet pornography use suggested that the groups were also significantly different in levels of experiential avoidance, with experiential avoidance being linked to stress associated with problematic online pornography use rather than online pornography use more generally.

With a sample of 157 undergraduate college males, Levin et al. (2012) examined the association between internet pornography use and experiential avoidance in relation to various mental health problems, including depression, anxiety, and stress. They found that most participants reported little to no viewing online pornography on an average day (50.4% reported no viewing at all on an average day), and 7.9% reported viewing one or more hours of online pornography on an average day. In relation to heavy viewing, one participant reported 4–5 h daily pornography viewing and one participant reported five or more hours daily. The viewing of any pornography was significantly associated with mental health difficulties, including depression, anxiety, and stress, as well as poor social functioning.

Harper and Hodgins (2019) attempted to define both problematic and non-PPU and to show whether these definitions were dependent on the perspective adopted, including mental health, feminist, and/or religious. With a sample of 191 adult students, the study indicated higher scores on addictive measures of online pornography use were associated with daily or more frequent use of online pornography. However, contrary to other studies, the results suggested that there was no direct association between the amount and frequency of an individual's pornography use and mental health indicators, such as anxiety, depression, and life and relationship satisfaction. In addition, significant associations with high online pornography addiction scores included early first exposure to online pornography, addiction to videogames, and being male.

### **Limitations**

This group of studies had a number of limitations. First, concerning general limitations, due to their cross-sectional nature, causality between variables examined in these studies could not be determined. Second, these studies involved participants from a single location and, as such, caution should be exercised in relation to the generalizability of the

findings. There were also limitations specific to individual studies. For instance, Borgogna et al. (2012) study did not assess specific demographic moderators (e.g., religiosity and sexual orientation) that could have had an impact on the findings. Borgogna et al.'s (2022) sample primarily comprised white heterosexual males. The lack of gender and ethnic minority representation may have diminished the relevance of the findings. All the studies used self-report measures which are subject to recall bias. With regards to pornography use, Camilleri et al. (2020)'s study did not distinguish between the duration of individual sessions (e.g., one hour once a month vs. five hours once a month), while Maddock et al. (2019) used a self-perceived PPU assessment tool created by the research team using factor analysis of the dataset (rather than a validated psychometric instrument). Consequently, the assessment tool and its factor structure may not be generalized to other samples. Another limitation associated with assessment tools was highlighted in the Tan et al. (2022) study, where the researchers used a general distress scale—the Kessler Psychological Distress Scale—to assess distress experienced specifically from internet pornography use. Furthermore, in the Levin et al. (2012) study, the frequency and the problems associated with pornography viewing were assessed using single items that were not based on any previously validated measure, and the frequency of pornography use was assessed with a particular focus on high-frequency viewing (e.g., how many hours participants viewed pornography on an average day). Consequently, this approach did not facilitate an adequate assessment of more infrequent viewing (e.g., once or twice a month), which may have contributed to the low frequency of pornography viewing among female participants. Lastly, the sample used in Harper and Hodgins' (2019) study consisted of psychology students. Consequently, some participants may have been familiar with the scales used in the study.

### ***The Impact of Mental Health Outcomes on Problematic Pornography Use***

Five studies investigated the impact of mental health variables (including impulsivity and attachment styles) in predicting or moderating PPU. Doornwaard et al. (2016) examined whether factors from three distinct psychosocial domains (psychological wellbeing, sexual interests/behaviors, and impulsive-psychopathic personality) predicted symptoms of compulsive use of sexually explicit internet material among 331 adolescents. The study indicated that most consumers of online pornography material did not report high levels of compulsivity. However, a small group of boys (i.e., between 4.2% and 11.2% reported compulsive-related symptoms on an occasional basis). In addition, the study suggested that lower levels of global self-esteem and higher levels of excessive sexual interest predicted boys' symptoms of compulsive use of online pornography use. Lastly, the

study suggested that both psychological well-being factors and sexual interests/behaviors were associated with the development of compulsive use of online pornography content among adolescent boys.

A study by Droubay et al. (2020) examined the role of solitary sexual desire, moral incongruence, feelings of emotional dysregulation, and shame-proneness in predicting subjective distress among 559 adult pornography viewers (55% male). The findings indicated that sexual desire was positively associated with individuals' perception of their pornography viewing being dysregulated, with this association being moderated by moral incongruence. Furthermore, the study found that the relationship between sexual desire and subjective distress was fully mediated by feelings of dysregulation, indicating that the relationship between sexual desire and subjective distress was associated with participants' perception of their pornography consumption.

Levi et al. (2020) conducted a study to examine the relationship between online sexual activities and both impulsivity and compulsivity. Using a sample of 139 adults (98 females), the study examined whether compulsivity, depression, and general anxiety contributed to the variance of compulsive sexual behavior disorder (CSBD) among participants who used the internet for finding a sexual partner. Using multiple regression analysis, the authors found that the Barratt Impulsiveness Scale and the Short Internet Addiction Test scores contributed to the variance of sexual addiction rates explaining 33% of the variance. This suggested that both impulsivity and problematic use of online pornography were associated with CSBD.

With a sample of 85 adult participants (38 males 47 females), Niazof et al. (2019) examined the relationship between Attention-Deficit and Hyperactivity Disorder (ADHD), attachment style, sensation-seeking, and PPU. There were 30 participants who met the diagnostic criteria for ADHD (35%). The findings of the study suggested that participants with ADHD scored higher on avoidant attachment style and pornography use when compared to participants without ADHD. In addition, the study suggested that the anxious attachment style was positively associated with PPU, indicating an association between anxiety and excessive pornography use.

Sommantico et al. (2021) examined the association between relationship satisfaction, body image, depression, and self-perceived PPU with a sample of 158 adult gay males. The findings of indicated a positive association between sexual minority males' body image and dissatisfaction, and gay male pornography consumption. These results suggest that exposure to online pornography was highly positively associated with body dissatisfaction and depression. However, contrary to previous research (e.g., Perry, 2017; Short et al., 2015), the study did not find significant statistical differences between PPU and religiosity, suggesting that religious beliefs are not correlated with

pornography consumption. Lastly, the study indicated both a direct and indirect effect of depression on self-perceived PPU, *via* relationship satisfaction. The findings suggest that depressed gay and bisexual males may be at risk for self-perceived PPU, due to lower levels of relationship satisfaction.

### **Limitations**

The main limitations of this group of studies were associated with the correlational design which precludes any causality between variables and to the use of self-report data. These types of measure may lead to inaccuracies in participants' responses and to social desirability bias. Also, in studies using adolescent samples (e.g., Doornwaard et al., 2016), self-report methods may not fully capture data due to underreporting linked to fear of embarrassment or social sanctions. Other limitations were associated with specific studies. Doornwaard et al.'s (2016) study only examined the relationship between psychosocial factors and compulsive use of online sexual material over a short period (6-month interval). Therefore, it is unclear whether this relationship would be significant later in adolescence or adulthood, or whether the association diminishes over time. Levi et al.'s (2020) study included mostly female participants which may have contributed to gender bias when assessing scores for impulsivity. There were also sample differences in relation to employment, where in the first study most participants had a part-time job, whereas, in the second study, this was the case for only 16% of participants.

Furthermore, in the study by Niazof et al. (2019), the ADHD diagnosis was determined by self-report measures without validated clinical records and the severity of the diagnosis was not assessed. Lastly, the sample used in Sommantico et al.'s (2021) study was relatively small, which may limit the generalizability of the findings. In addition, the stigma attached to the full disclosure of ratings concerning body satisfaction and/or pornography consumption may have had other impacts on the data. For instance, the stigma attached to the disclosure of ratings concerning body satisfaction and/or pornography viewing may have skewed the data due to the shame surrounding both the admission of consumption of pornographic material and conversations about body image.

### **Other Studies Examining Mental Health Outcomes and Problematic Pornography Use**

Bibi et al. (2002) examined the potential cognitive and affective factors (e.g., depression, anxiety, loneliness, and self-esteem) that could help explain the maintenance and exacerbation of self-defined problematic internet pornography use with a sample of 280 adults. The results indicated



that both pornography craving and self-identified PPU (SIPPU) were prevalent among participants, with approximately 80% indicating a strong craving as defined by the assessment scale, and approximately 70% indicating a level of SIPPU that may have suggested the need for clinical assessment and intervention. The study also suggested that the relationship between predisposing factors (depression, anxiety, and self-esteem) and SIPPU was significant in the presence of craving as a mediating variable. Furthermore, depression, anxiety, and self-esteem were significantly associated with PPU through two serial mediation pathways: (a) craving and stimulus-specific inhibitory control, and (b) craving and dysfunctional sexual coping.

Bóthe et al. (2020) conducted three studies (comprising 15,161 participants in total; 4,480 females) that attempted to identify profiles of pornography use based on frequency of pornography use (FPU) and PPU and examined whether the identified profiles could be distinguished based on demographic and psychological constructs (comprising depressive symptoms, satisfaction with life, and self-esteem). Three distinct profiles were identified in all three independent samples. The first profile, Nonproblematic Low-Frequency Use (NPLFU), was matched with 68–73% of participants and represented those who did not view pornography frequently and did not experience problems associated with their consumption. The second profile, Nonproblematic High-Frequency Use (NPHFU), was observed in approximately 19–29% of participants and represented those who viewed pornography as frequently as the members of the third profile. However, did not report high levels of PPU. The third profile, Problematic High-Frequency Use (PHFU), was observed in approximately 3–8% of participants and was associated with individuals who viewed pornography as frequently as the second group, but they experienced high levels of PPU. The findings indicated that FPU should not be considered a sufficient indicator of PPU because the number of participants with NPHFU was 3–6 times higher than those with PHFU. The results indicate that participants with PPU use pornography frequently. However, FPU may not always be problematic. Furthermore, participants with PHFU compared with those with NPHFU reported higher levels of hypersexuality, frustration of basic psychological needs, depression, boredom, lower levels of self-esteem, and relatedness satisfaction.

Brand et al. (2011) examined the potential predictors of a tendency toward cybersex addiction in terms of subjective complaints in everyday life due to online sexual activities. Using a sample of 89 adult males, the study found a positive association between subjective sexual arousal when watching online pornographic pictures and self-reported problems in daily life due to the excessiveness of cybersex as assessed using the Internet Addiction Test modified for online sexual activities (IATsex). Furthermore,

subjective arousal ratings, the global severity of psychological symptoms, and the number of sex applications used were significant predictors of the IATsex score, while the time spent on internet sex sites did not significantly contribute to the explanation of variance in the IATsex score. The association between self-reported problems in daily life associated with cybersex and psychological symptoms was consistent with a study by Yang, Choe, Baity, Lee, and Cho (2005) in which the 90-item Revised Symptom Checklist (SCL-90-R) was used to assess psychological symptoms among participants with excessive internet use when compared to moderate and mild users.

Chen et al. (2018) also proposed and tested a model by which pornography craving may promote more frequent engagement in online sexual activity (OSA) and more time spent engaging in such activities. Furthermore, they suggested this may lead to problematic OSA and subsequent negative consequences. To conduct the study, 1,070 adult students (622 males, 448 females) from a Chinese University were recruited. The results indicated that 20.6% of participants were at risk of problematic OSA use. In addition, this group appeared to have a greater frequency of OSA, more time engaging in OSA, higher pornography cravings, and more negative academic emotions. It was suggested that pornography craving was associated with the problematic use of OSA and OSA was associated with negative mental health outcomes (e.g., boredom, stress, and depression).

Lastly, Leonhardt et al. (2018) assessed how pornography use, religiosity, and perception of pornography addiction were associated with relationship anxiety in relation to pornography use with a sample of 686 non-married adults (350 males, 336 females) who had used pornography before. The findings indicated that higher pornography use, perception of pornography addiction, and religiosity were all associated with heightened relationship anxiety surrounding pornography use, with the perception of pornography addiction having the strongest association with relationship anxiety surrounding pornography use. However, when the perception of pornography addiction was included as a mediator in a structural equation model, pornography consumption only had a small indirect effect on relationship anxiety surrounding the consumption of pornography, and the perception of pornography addiction partially mediated the association between religiosity and relationship anxiety surrounding pornography use.

### **Limitations**

There are several limitations to these studies. As aforementioned, the correlational nature of the studies, the use of self-report measures, and the fact that these studies involved samples from a single location means that caution should be exercised when generalizing the findings and when

inferring causality between variables. Bibi et al.'s (2002) study was conducted in Pakistan which is a sexually restricted society and has a taboo in discussing pornography consumption. Therefore, the sample size was moderate which may have limited the generalization of the findings to that population. There was also the recognition in Bóthe et al.'s (2020) study that the internal consistency of some of the scales used was not optimal.

## DISCUSSION

While the consumption of online pornography is non-problematic for most users, and with some consumers reporting positive outcomes (McKeown et al., 2018), this has not stopped research examining the relationship between self-perceived PPU and mental health outcomes. Furthermore, studies (e.g., Poulsen, Busby, & Galovan, 2013) have suggested that the relationship between online pornography and negative outcomes is dependent on the meaning attached to pornography use.

A wide range of categories and diagnoses have been suggested to understand and better define PPU, including compulsivity (Cooper, Scherer, Boies, & Gordon, 1999), impulsivity (Shapira et al., 2003), and hypersexual disorder (Kaplan & Krueger, 2010). Despite pornography use being understood by some authors as belonging to the spectrum of behavioral addictions (e.g., Pinna et al., 2015), the ICD-11 includes it under the diagnostic spectrum of compulsive sexual behavior disorder (Grubbs et al., 2020).

The present review systematically reviewed the evidence of studies that have examined and assessed the relationship between PPU and mental health outcomes. The findings from the review highlighted that the relationship between PPU and mental health is not always clear and that there are several mediating factors that can influence the association. The 20 studies included in the present review were grouped into three different categories: (i) the impact of PPU on mental health outcomes, (ii) the impact of mental health variables on PPU, and (iii) other studies examining mental health outcomes and problematic pornography use. With regards to the first category, contrary to previous studies (e.g., Albright, 2008), the findings from Borgogna et al. (2018) did not support the hypothesis that viewing frequency would be negatively associated with females' body image satisfaction. There could be many reasons for this discrepancy. For instance, female participants included in this sample may have been able to identify the idealistic nature of the body image standards that are often represented in the pornography industry. This insight could have constituted a protective factor against body image dissatisfaction. In addition, participants might have been exposed to pornography content specifically designed for the female audience.

Borgogna et al.'s (2022) study highlighted a positive relationship between PPU and increases among psychological distress in veterans compared to non-veteran males. The study also highlighted the role of boredom as a mediating factor in this relationship. Prior research by Vincent (2020) highlighted the vulnerability of US actively deployed military members to consume more pornography when compared to those who are not deployed. This might be understood in the context of US veterans experiencing a lack of sexual stimulation or opportunities to meet their sexual needs outside the consumption of pornography. Moreover, hypersexuality has also been positively associated with traumatic stress in cross-sectional and longitudinal studies (e.g., Rosansky et al., 2022).

Concerning the potential mediating role of religiosity, the findings of the present review were inconsistent. For instance, Camilleri et al.'s (2020) study suggested an influence of faith, morality, and personal motivation in efforts to decrease pornography use, with previous research indicating that levels of religiosity are associated with a lower frequency of pornography consumption (Poulsen et al., 2013; Perry & Hayward, 2017). However, the study by Maddock et al. (2019) found that neither religiosity nor the interaction between religiosity and pornography use predicted self-perceived compulsive pornography use. These results suggest that more religious individuals who viewed pornography were about equally as likely as less religious individuals who viewed pornography to perceive themselves as using pornography compulsively. These findings are also inconsistent with previous research suggesting that religious individuals are more likely than non-religious individuals to perceive themselves as addicted to pornography (Bradley et al., 2016).

In relation to the association between PPU and psychological distress/psychopathology symptoms, the studies by Musetti et al. (2022), Okabe et al. (2021), and Tan et al. (2022) found a positive relationship between these variables. These findings concur with studies which have suggested a relationship between problematic use of online sexual activities and symptoms of depression and anxiety (Hermand et al., 2020) and other studies that have highlighted the role of problematic pornography use in the development of psychopathological symptoms (Brand et al., 2011; Grubbs et al., 2015a). Okabe et al. (2021) concluded that frequency of use was significantly associated with problematic use, but duration of use was not. That is, those who engage in PPU may not spend much time in actual use per viewing session. This suggests that whereas some individuals may be able to manage their pornography viewing irrespective of duration of use, others may experience loss of control due to the frequency pornography use. Lastly, Tan et al. (2022) concluded that females who reported problematic internet pornography use experienced greater psychological distress when compared to males. These results can be explained in the

context of females with problematic online pornography use being more vulnerable than males to developing psychopathological symptoms, including loneliness and anxiety.

The study by Wetterneck et al. (2012) also provided insight regarding the relationship between problematic internet use and sexual compulsivity, impulsivity, and experiential avoidance. The number of hours per week spent viewing online pornography appeared to be associated with the use of avoidance coping strategies or experiential avoidance. This concurs with previous studies indicating that experiential avoidance may maintain and/or aggravate compulsive (Twohig et al., 2010), impulsive (Flessner et al., 2008), and addictive (Stotts et al., 2009) behaviors. Furthermore, and consistent with a reinforcement model which suggests that both positive and negative reinforcement are likely to perpetuate a behavior, Wetterneck et al.'s (2012) study suggested a positive relationship between the frequency of online pornography and positive outcomes (e.g., sexual arousal and sexual gratification) and negative outcomes (e.g., loneliness and boredom) from its use. The consumption of online pornography is likely to provide both physiological and psychological reinforcement (e.g., sexual gratification), perpetuating online pornography use. Likewise, online pornography consumption may also be perpetuated through negative reinforcement as a coping strategy to manage distressing internal experiences, including boredom, loneliness, anger, and frustration.

Lastly, while Levin et al.'s (2012) study complements a body of literature suggesting that frequent online pornography consumption is associated with psychosocial problems (comprising depression, anxiety, stress, and social functioning) (e.g., Manning, 2006; Yoder, Virden, & Amin, 2005), the relationship between viewing pornography and these problems is relatively weak. These findings are consistent with the literature that indicates that the relationship between frequent viewing of pornography and mental psychosocial difficulties is complex and other factors may influence or impact this relationship. Levin et al.'s (2012) study also indicated that experiential avoidance may play a role in establishing whether pornography viewing becomes problematic, which is corroborated by other studies (e.g., Hayes, Luoma, Bond, Masuda, & Lillis, 2006) suggesting that experiential avoidance is associated with psychosocial problems, with paradoxical harmful effects. Furthermore, research (e.g., Abramowitz, Tolin, & Street, 2001) suggests that engaging in patterns of behaviors as coping strategies to manage distressing or overwhelming internal experiences can increase their occurrence, creating a vicious cycle where the individual becomes too attached to those coping strategies as opposed to developing healthier and more adaptive patterns of behaviors. As such, it may not be the frequency of consuming pornography itself that is associated with psychosocial

difficulties, but the function of that behavior (e.g., resorting to pornography to manage boredom, frustration, and lack of intimacy).

The overall findings from the present review further strengthen the argument that the relationship between PPU and mental health outcomes is not clear-cut, and it is often mediated by other factors such as loneliness, anxiety, and self-esteem. Further studies are required to evaluate the prevalence of PPU along with both risk and protective factors which are associated with exposure to online pornography.

### ***Clinical and Research Implications***

Consistent with prior research in this field, the findings of the present review provide implications for both research and clinical work. With regards to research, further studies examining self-perceived PPU need to also control for actual levels of pornography consumption. The concepts of emotional dysregulation and psychological distress associated with online pornography use are subjective to individuals' experiences and, as such, further research should focus on the relationship between actual behaviors and self-reported perceptions of those behaviors. In relation to clinical practice, the present review adds to the body of literature suggesting that other factors, such as perceived disruption and consequences, moral incongruence, or generalized distress, may need to be the primary focus of treatment for problematic online pornography use. In line with this, the present review suggests that prevention of PPU may be associated with improvements in the general lifestyle and overall mental well-being. This may include (i) engaging in physical activities and relaxation practices to manage or reduce the intensity of negative thoughts or overwhelming distressing feelings, (ii) boosting social and intimate relationships to tackle feelings of social alienation and loneliness, (iii) focusing on developing educational and vocational skills to strengthen both self-esteem and self-confidence, and (iv) seeking professional support to address mental health difficulties, including depression, anxiety, and trauma.

Another clinical implication is the role of self-perception regarding pornography use as well as the role of attitudes and behaviors concerning the consumption of pornography. The studies included in the present review highlighted how some individuals may hold negative assumptions and attitudes in relation to their pornography use and it is this belief system that is often associated with psychological distress and negative mental health outcomes as opposed to the exposure to pornography *per se*. As such, it is key that clinicians and practitioners working with individuals who engage in PPU explore the function of that behavior, the attitudes attached to it,

as well as positive and negative enforcement that might be perpetuating the consumption. The exploration of identities, the role of both maladaptive coping strategies for mood management and mediating factors, alongside protective factors such as social capital might prove to be an effective intervention strategy as opposed to conceptualizing pornography use as an isolated symptom that should be tackled through behavioral strategies.

The findings from the review also outline the efficacy of using a wide range of assessment tools to collate information concerning mental health outcomes (e.g., Beck Depression Inventory-II, Body Parts Satisfaction Scale-Revised, Brief Sensation Seeking Scale, Brief Symptom Inventory 18, Center for Epidemiologic Studies Depression Scale-Revised, Cognitive and Affective Mindfulness Scale-Revised, and Depression Anxiety and Stress Scale-21) which, in turn, can strengthen the development of effective treatment plans and clinical formulations for those struggling with PPU.

Lastly, the present review demonstrates that there is a wide range of assessment tools that examine PPU, including (among many others) the Brief Pornography Screening (BPS), Compulsive Internet Use Scale, and Cyber Pornography Addiction Test (CYPAT), Cyber Pornography Use Inventory (CPUI), and Excessive Use Subscale of the Problematic Pornography Use Scale. These screening instruments strengthen clinical discussions with those who engage in PPU and facilitate the development of appropriate psychological interventions through the recognition of problematic addictive behaviors and core problematic areas in the individual's life, including relationships, emotional wellbeing, and social functioning. They also add to the growth of academic literature and empirical research in the field by assessing psychological constructs related to pornography addiction and by allowing a more systematic and reliable way of assessing psychological constructs and reporting study outcomes rather than other assessment methods.

### ***Limitations of the Literature Review Process***

The present review systematically examined the empirical evidence regarding the relationship between PPU and mental health outcomes. However, the review process itself is not without its limitations. The search strategy only included papers available with full texts and even though the research team used specific words to capture problematic pornography use (PPU), including “problematic pornography,” “pornography addiction,” and “compulsive pornography use,” there is a chance that some studies that explored the relationship between PPU and mental health were not captured using these search words. In addition, only English language studies and peer-reviewed studies were included in the review. Taking these limitations into account, the findings in the present review should be interpreted with

caution. The relationship between (problematic) pornography use and mental health outcomes remains open for debate within the academic literature, with the role of both mediating factors and self-perceived PPU playing important variables in such a relationship.

### **Conclusion**

The current scientific evidence regarding pornography use and relationship with mental health outcomes remains scarce. There is no single (and agreed upon) definition of problematic use of pornography since both researchers and academics in the field have conflicting views. PPU can generally be described as persistent difficulties in reducing or controlling pornography use despite negative outcomes regarding personal, relational, and/or occupational functioning. Whether PPU constitutes an addiction remains open for debate within the scientific community and despite the growing number of studies exploring the relationship between PPU and mental health outcomes, the findings remain unclear. Therefore, the present review synthesized the literature associated with the relationship between PPU and mental health, which highlighted the role of mediating factors, such as religiosity, anxiety, loneliness, and self-esteem.

The overall findings from this review suggest the relationship between PPU and mental health outcomes is not clear-cut. Further studies are required to evaluate the prevalence of PPU along with risk and protective factors which are associated with exposure to online pornography. Most studies have relied on homogenous samples which have limited the generalizability of findings. The use of representative samples, including both males and females with different sexual orientations and from diverse cultural and ethnic backgrounds, would strengthen the understanding of PPU. Clinical recommendations and further research were also outlined, including the importance of both clinicians and practitioners working with individuals who engage in PPU to explore the function of that behavior, the attitudes attached to it, as well as positive and negative enforcement that might perpetuate PPU consumption.

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## ORCID

Claudio Vieira  <http://orcid.org/0009-0002-3561-8479>

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